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Paper Makers Oppose Freight Rate Increase

S. L. Willson, President of American Paper & Pulp Association, Appearing Before Interstate Commerce Commission, States That Paper Production Costs Would Mount to $2 Per Ton If Railroads Request Were Adopted—Asserts That Canvass of Paper Manufacturers Shows Practical Unanimity Against Proposal

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 19, 1931—Paper production costs would mount $2.00 per ton if the 15 per cent freight rate increase were granted by the Interstate Commerce Commission, S. L. Willson, president of the American Paper and Pulp Association told the Commission at a hearing here last Friday when he appeared against any increase. Mr. Willson stated that a canvass of paper makers on the subject showed that they were "almost unanimous" against the freight rate increase. Mr. Willson said:

"In a canvass made by the American Paper and Pulp Association of the principal shippers of paper and paper products in the United States for an opinion on the question of the granting of a 15 per cent increase in freight rates, a very emphatic and almost unanimous protest to such an increase was expressed.

"Paper and paper products is one of our leading industries; in volume for finished products amounting to over one billion dollars. Considering the fact that from three to five car loads of raw materials are required to produce one carload of finished paper, it is easy to visualize the great extent that those engaged in the industry would be affected by an increase in rate of 15 per cent—which under present downward trend of prices could not be passed to the consumer—but which would necessarily have to be absorbed by the manufacturer, and increase his present losses.

"According to statistics gathered and already filed, the increased cost of finished paper with a 15 per cent increase in freight rate would average two dollars per ton; or a total of $20,000,000—based on production in 1930 of more than ten million tons. An increased revenue of $400,000,000 is proposed to be raised through a petitioned increase in freight rates. According to United States Census Bureau the total volume of business of manufactured products in the United States in 1927 was $63,000,000,000, of which more than $1,000,000,000 was paper products.

"The increased cost based on a 15 per cent increase in freight rates to the paper industry, would be approximately $20,000,000—or 5 per cent of the contemplated increase in revenue asked for by the railroads, while the volume of manufactured products, using the same period for comparison, would only be one and six tenth per cent, thus showing that the relative percentage of the country's total volume of manufactured products compared with that of finished paper products and the percentage of the revenue proposed to be raised thereon, compared to the total, is all out of proportion. It is apparently proposed to tax the paper industry 5 per cent while its proportion of the total would be 1.6 per cent.

Gradual Increase Since 1916

"Since 1916 freight rates on the whole have increased 63 per cent—with an additional 15 per cent this would be 78 per cent, while the average price of paper commodities since 1919 have decreased from $110.86 per ton to $80.93 per ton—equivalent to a decrease of 26-9/10 per cent. Approximately 7,000,000 tons of the manufactured products are sold on a delivered zone price, within which zone freight rates may vary from one to five or more cents per cwt., and any increase within such zone, not exceeding the maximum rate applied for that zone, would necessarily be absorbed by the manufacturer, as evidenced by the decline in paper prices during the past ten years while freight rates have increased during the same period.

"There is no industry not affected by present business conditions—the paper industry could as reasonably ask for relief, if a commission existed to consider such a proposition, as for the railroads to now ask for this relief, which it doubtless needs for profit earnings, but their present unsatisfactory condition is due, in our opinion, more because of business depression and the increasing use of competitive trucks, which will be further augmented by the recently ordered increase of rates in the first four classes, than because of present rates being too low.

"It would be unreasonable for any industry to ask the Interstate Commerce Commission to reduce rates for its benefit—predicated upon the fact that under present business conditions it cannot operate at a profit, but that in the opinion of many seems to be the basis on which the railroads are petitioning for a rate percentage increase. If there are specific rates that are manifestly unfair to the railroads—they should have relief, but a 15 per cent increase would tend to localize industry and eliminate its national scope, as it exists today, and create inequalities in rates between long and short hauls.

"I have knowledge of a company which has a large

(Continued on page 30)

Canada Power & Paper Reorganization Effected

Success of Security Holders Protective Committee's Plan Practically Assured—Representative Board of Directors Appointed Restores Public Confidence—Company to be Known In Future As Consolidated Paper Corp.—L. J. Belnap Elected President

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 17, 1931.—In future the Canada Power and Paper Corporation will be known as the Consolidated Paper Corporation. The latter is the name decided upon by the Security Holders Protective Committee, who have announced that their plan for the reorganization of the company will be put into effect, following upon a deposit of the majority of all securities for exchange into securities of the new company. The feature of the announcement recording the success of the reorganization plan was the naming of one of the most representative boards of directors ever appointed in connection with a Canadian industrial project, the services of men eminent in the financial and industrial life of the country having evidently been secured in the effort to restore the confidence of investors.

Latest figures on deposits of securities with the committee up to August 10 attest to the general nature of the approval accorded the plan by the various classes of shareholders of Canada Power and Paper. Deposits of bonds had a par value of $36,172,434, or 84.5 per cent of the outstanding amount of bonds. Debentures deposited had a par value of $26,710,600 or 75.3 per cent of the total, preferred stock deposited totalled $19,127,200, or 79.7 per cent, while deposits of common stock totalled 1,196,055 no par value shares, or 84.7 per cent, of the 1,410,938 shares at present outstanding.

In order to give further opportunity to minorities still outstanding to become direct participants rather than incur the complications and possible additional expense otherwise involved the Committee has further extended the time for deposit of securities under the plan to August 31.

Meanwhile the special committee of the Belgo shareholders, representing the only organized opposition to the plan, has issued a notice to the effect that the committee's auditors, Price, Waterhouse & Co., are now examining the records and data used in formulating the plan of reorganization proposed by the Dunning Committee. It is expected that a report giving findings will be issued some time next week.

Belgo preferred shareholders claim the reorganization plan does not provide for an equitable distribution of the new securities and a special committee was formed to enquire of the committee as to how and why it appraised the value of one Belgo preferred at three shares of common stock in the new company.

Personnel of the Directorate

In its announcement the Securities Holders Protective Committee stated that it had been decided to form a directorate of fifteen for the administration of Consolidated Paper Corporation, with a majority to serve for five years, at the end of which time, by the way, the company will be receiving the benefits of its contract with the Hearst interests. As partly composing this directorate the following nine gentlemen have agreed to act:

L. J. Belnap, president, formerly president Worthington Pump and Machinery Corporation; director, United Dry Docks Corporation; director, Certain-teed Products Corporation; director, U. S. Hoffman Machinery Company; director, Worthington, Simpson, Ltd., London, England.

F. G. Daniels, president and managing director, Dominion Textiles Company, Ltd.; president, Montreal Cottons, Ltd.; director, Dominion Glass Company; director, Crown Trust Company.

Norman J. Dawes—president and managing director National Breweries, director Royal Trust Company, director Dominion Bridge Company, director London and Scottish Assurance Company.

The Hon. C. A. Dunning—Former Minister of Finance for Canada, vice-president Ontario Equitable Life Assurance Company, vice-president Lucerne Association, Ltd.

Col. H. D. Lockhart Gordon—Clarkson, Gordon, Detworth, Guilfoyle & Nash, chartered accountants, Toronto.

Ross H. McMaster, president Steel Company of Canada, director Bank of Montreal; director, Canadian Pacific Railway; director, Royal Trust Company.

E. A. McNutt, treasurer, Sun Life Assurance Company of Canada; vice-president, Montreal Board of Trade.

John J. Rudolf, partner, Iselin & Co., New York.

Charles F. Sise, president, Bell Telephone Company of Canada; director, Royal Trust Company; director, Northern Electric Company; director, London & Scottish Assurance Company.

In addition to those above named the committee will recommend six names for approval at the first shareholders' meeting. The following five gentlemen have expressed their willingness to act: as to the sixth, the committee hopes to be able to announce shortly the name of a prominent executive of the Bank of Montreal:

Harold Crabtree, president, Howard Smith Paper Mills, Ltd., vice-president, Canadian Cellulose.

W. H. Howard, K. C. Brown, Montgomery & McMichael, advocates, Montreal.

Beaudry Leman—General manager, Banque Canadienne Nationale; director, Shawinigan Water and Power Company; director, Montreal Tramways Company; director, Trust Generale du Canada.

Charles E. Neill—Vice-president and managing director, Royal Bank of Canada; director, Montreal Trust Company; director, Shawinigan Water and Power Company; director, Dominion Bridge Company.

Arthur B. Purvis—president and managing director, Canadian Industries, Ltd.; vice-president, Barclays Bank (Canada); director, General Motors Corporation; director, Dunlop Tire and Rubber Goods Company, Ltd.

The New Capital Structure

Briefly the plan calls for the formation of a new company, with a capitalization of first mortgage bonds (including first mortgage sterling debenture stock) and one class of shares, which will take over the undertakings and assets of the Canada Power and Paper Corporation and constituent companies. No new money will be asked for.

Authorized capitalization of the new company will, under the plan set forth, consist of $100,000,000 first mortgage bonds, including first mortgage sterling debenture stock, and 2,000,000 shares without par value. Of the bonds $65,000,000 will be authorized for immediate issue as 30-year 5½ per cent bonds and sterling debenture stock, which will be on an income basis for five years, but will bear fixed interest thereafter.

The Position of Security Holders

The plan provides that holders of existing first mortgage securities will receive first mortgage securities of the new company and, as compensation for loss of accrued interest and foregoing fixed interest for the first five years, will receive shares of the capital stock of the new company. Holders of Laurentide and Wayagamack Series of Canada Power and Paper debentures will receive a percentage of new first mortgage bonds together with shares of the capital stock of the new company. Holders of existing preferred and common shares will receive shares of the capital stock of the new company.

To summarize the position of each class of security holders under the plan:

Belgo bondholders receive $125 of new first mortgage bonds and one share of new stock for each $100 of present bonds.

Belgo preferred shareholders receive three shares of new stock for each present preferred share.

Wayagamack Pulp and Paper first mortgage bondholders receive $125 of new first mortgage bonds and one share of new stock for each $100 of present bonds.

Port Alfred bondholders receive $100 of new first mortgage bonds and one share of new stock for each $100 of present bonds.

Port Alfred first mortgage registered debenture stockholders receive £20 of new first mortgage sterling debenture stock and one share of new stock for each £20 of present first mortgage registered debenture stock.

Port Alfred preferred shareholders receive one and one-half shares of new stock for each present preferred share.

St. Maurice bondholders receive $100 of new first mortgage bonds and one share of new stock for each $100 of present bonds—Series "A" or "B."

St. Maurice first mortgage registered debenture stockholders receive £20 of new first mortgage sterling debenture stock and one share of new stock for each £20 of present first mortgage registered debenture stock.

St. Maurice Preferred shareholders receive one and one-half shares of new stock for each $100, or for each 20 shares of $5 (£1) each, of present preferred stock.

Anticosti bondholders receive $100 of new first mortgage bonds and one share of new stock for each $100 of present bonds.

Anticosti preferred shareholders receive one and one-half shares of new stock for each present preferred share.

Canada Power and Paper Debenture holders receive $15 of new first mortgage bonds and one and one-half shares of new stock for each $100 of present debentures—Laurentide or Wayagamack Series.

Canada Power and Paper shareholders receive one share of new stock for each ten present shares.

Provision has been made in the plan so that the odd common shares of Belgo, Port Alfred, St. Maurice and Wayagamack, outstanding in the hands of the public, may be exchanged for new shares.

Fixed Charges Eliminated

The primary purpose of the reorganization plan was to relieve Canada Power and Paper of heavy fixed capital charges—charges so large that the company was not able to earn sufficient money to meet them. The new capital set-up makes possible the limination of all fixed charges for a period of five years, during which period it is expected that the company will be able to build up an adequate working capital and place its finances in a sound position, by which time contracts now in hand or in sight will permit the new company to establish an adequate earning power on the basis of the new capitalization.

Canada Paper Co. to Cancell Lease

Preferred shareholders of Canada Paper Company, common stock control of which is held by Howard Smith Paper Company, Ltd., are being asked to approve of the cancellation of the lease of the business and undertaking of the company to St. Maurice Valley Corporation, and of the sub-lease thereof to Howard Smith Paper Mills, as well as of an agreement executed between the interested parties providing for such cancellation. St. Maurice purchased the entire common stock of the company in 1926, but when the former entered the Canada Power and Paper Corporation set-up, the new owners felt that inasmuch as special machinery would have to be set up for the marketing of Canada Paper's products (consisting of wrapping and book papers, etc.), it would be better to dispose of their interest to a company better able to handle the enterprise.

A deal to this end was arranged with the Howard Smith Paper Mills, and it is now proposed to bring this arrangement to an end.

In essence the preferred shareholders of Canada Paper Company are asked to approve of an agreement cancelling the obligations and liability of the lessee and sub-lessee. In return St. Maurice Valley and Howard Smith cancel advances of some $2,400,000 made to Canada Paper. Canada Paper credits Canada Power and Paper with a sum not exceeding $397,107, which sum will be met by Howard Smith.

The new result will be that Canada Paper Company will be cleared of its indebtedness to St. Maurice Valley (Canada Power and Paper) and Howard Smith. It will have a substantial working capital, according to officials of the company, and future bond interest and preferred dividend payments will depend upon earnings of the company.

In this connection Harold Crabtree, president of the Canada Paper Company, says: "Granted this rearrangement of its affairs, your company will be in a position to resume dividend payments on its preferred shares within a reasonable time after return of normal business conditions."

The whole scheme of rearrangement, however, hinges on (first) approval of the preferred shareholders and (secondly) on the reorganization plan of Canada Power and Paper being completely and effectively carried out.

Frank L. Kemp Dead

[FROM OUR REGULAR CORRESPONDENT]

AUSABLE FORKS, N. Y., August 17, 1931.—Frank L. Kemp, secretary and general manager of the J. & J. Rogers Company, died suddenly at his home here early this week following an attack of heart trouble. He had been active in performing his duties up to the time of his death which came as a shock to his many friends in the paper industry. He was born in this village in 1877 where he was educated.

In 1895 he entered the employ of the local paper company as secretary to the president, the late James Rogers. He won promotion rapidly as he grasped a knowledge of the business and in 1922 he was made secretary of the firm. In 1929 he was promoted to the position as general manager which he filled in addition to his secretarial duties.

The decreased was regarded as one of the most prominent citizens in Essex county. He was prominently identified with civic enterprises and a number of fraternal organizations. His wife and two sons are the principal survivors.

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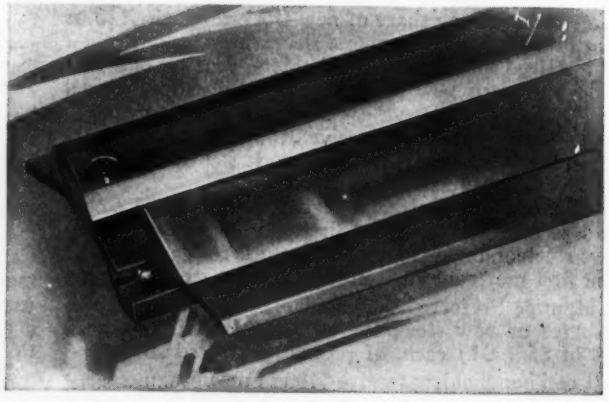

For Engineers

The Vickery Hi-Angle Doctor for press rolls is a development of the principle which has made the well-known, regular Vickery Doctor so universally successful — perfect, two-way flexibility, accomplished by two freely-supported flexible elements.

As the illustration shows, neither the blade nor the spring element is clamped. Each is free to compensate for variations in roll surface. The result is uniform distribution of pressure to every inch of roll surface under all conditions, without the buckling which is sure to occur, under certain conditions, with a doctor made up of one or more elements held rigidly. The Vickery two-way flexibility principle is an exclusive, patented feature of Vickery Doctors.

The VICKERY HI-

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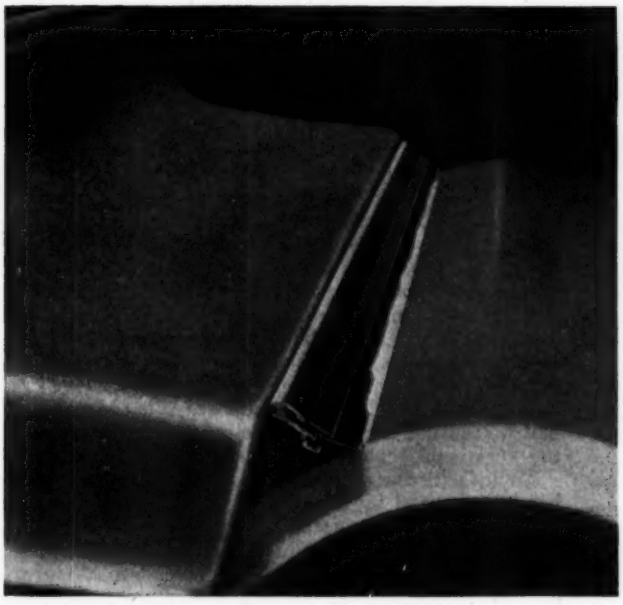
Doctor Rolls!

Hi-Angle principle offers perfect doctoring . . . uniformly clean roll surfaces . . . fewer pick-ups and breaks



You can now eliminate every trouble — *every expense* — caused by press roll surfaces.

The Vickery Hi-Angle Doctor is waiting to do it for you.

A score of papermakers tried it out. They call it the world's finest press roll doctor — the *only* doctor that can do a perfect job *all the time*.

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Let us place in your hands a complete description of the new Vickery Hi-Angle Doctor — its design, installation and operation. Write.

4983

Consolidated Water Power Dam Improvements

Company Spending Approximately $100,000 to Increase Head of Water At Dam On Wisconsin River At Stevens Point Three Feet, Adding 1,000 h.p. to Its Capacity—Work Practically Completed and Increased Power Assured

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., August 17, 1931.—Most of the work has been completed by the Consolidated Water Power and Paper Company on the improvement of its power dam on the Wisconsin river at Stevens Point, Wis. The company is spending about $100,000 to increase the head of water at the dam three feet and adding 1,000 h.p. to its capacity. Formerly the dam developed 4,800 h.p. with a 14-foot head and it is now capable of producing 5,800 h.p. with a 17-foot head. None of this power will be used at the branch mill at Stevens Point, but will be transmitted to the main power station at the mill at Wisconsin Rapids, Wis.

Work was started last December, when two 3,000-gallon pumps were installed to drain water from a slough into the river. Two pumps of 50,000 gallons capacity also have been installed to remove water quickly from the slough in flood times. An intercepting sewer also was built to drain seepage water into the slough so as to help increase the head of the pond at that point.

It was necessary to raise tracks of the Soo railroad three feet and build several miles of dikes and retaining walls along the river to prevent flooding of Stevens Point. One of the walls will be used as a spillway to drain surplus water at flood times into what is known as the Rocky Run district. Improvements also were made in a city park to offset the flooding of some of the land. The head of water has been built up successfully and the increased power is assured. Work was directed by W. F. Thiele, chief engineer of the Consolidated company.

Dr. Zon Completes 30 Years Service

Dr. Raphael Zon, director of the Lake States Forest Experiment stations in Minnesota and Northern Michigan, completed thirty years of federal forest work in July, and has received congratulations from many sources on the work he has done to conserve the timber supply. In commenting on his service, Dr. Zon said:

"I have both hopes and fears for the future. Federal forestry has made progress. There are 170,000,000 acres of national forests. But our forests in private hands are disappearing faster than they were 25 or 30 years ago. The economic difficulties facing us are very great.

"It takes sixty years or more to raise trees for lumber. There is hope for the pulp paper industry, where you can raise trees of the necessary size in thirty years. But the comeback of real forestry in the United States is dependent here as it is in Europe on united public and private effort."

William Mauthe Continues Forestry Work

Although William Mauthe resigned recently as chairman of the Wisconsin Conservation Commission, the state will still have the benefit of his services. Mr. Mauthe has consented to act as chairman of the forestry committee of the commission's advisory council. His assistants will include D. C. Everest, of the Marathon Paper Mills Company, Rothschild, Wis.; R. B. Goodman, lumber and paper mill capitalist of Marinette, Wis.; A. R. Owen, lumberman of Owen, Wis.; Harry L. Russell, former dean of the Wisconsin College of Agriculture; and Dr. Raphael Zon, St. Paul, Minn., director of the Lake States Forest Experiment station. Mr. Mauthe has done more than any other state official to bring about reforestation and better protection of forests against the ravages of fire. He resigned as head of the conservation department recently when the state appropriation for this work was cut to less than half the former amount.

A. N. Strange Dead

Alexander Noble Strange died last week at his home at Menasha, Wis., after a two day illness. He became associated with the Strange Paper Company, of Menasha, now the John Strange Paper Company, in 1896 and operated the plant until 1905. From 1904 to 1925 he was secretary, treasurer and general manager of the Island Paper Company, Menasha, Wis. He was also associated with the Wolf River Paper and Fiber Company, of Shawano, Wis., for fourteen years and after leaving the Island company was active in its management for several years. Mr. Strange was prominent in the community life of his home city where he was active for more than half a century. He was buried in Oak Hill cemetery, Menasha. One son, Alexander, Jr., and two grandchildren survive him.

News of the Industry

Compensation for disability caused by a fractured vertebra is asked by Wenzel Grosser, of Appleton, from Kimberly-Clark Corporation, Neenah, Wis. He was injured some time ago when a roll of paper fell out of a box car and struck him on the neck. Hearings were held before the Wisconsin Industrial Commission and the merit of the application determined.

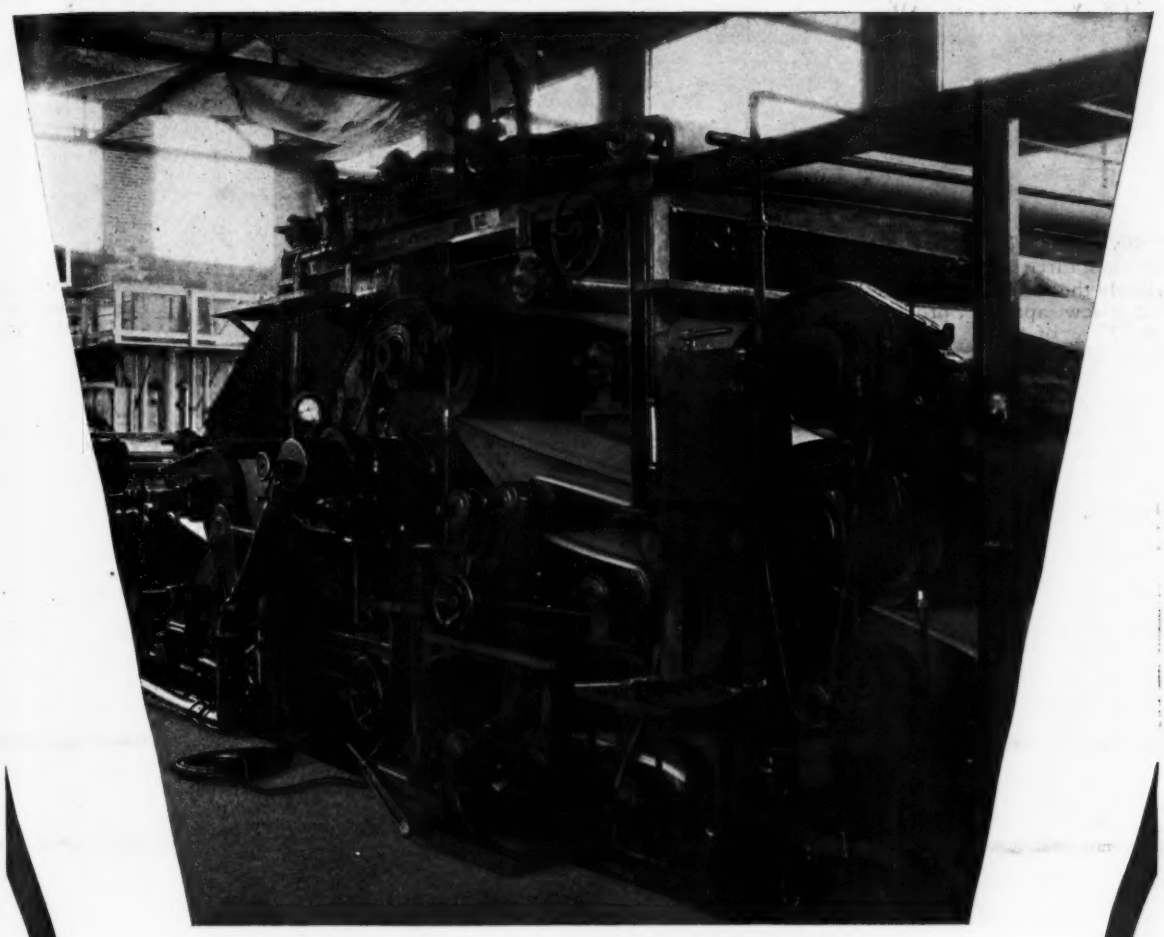
Adolph Ochs, publisher of the *New York Times*, spent several days last week as the guest of F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis. Mr. Ochs was accompanied by his daughter, Mrs. Arthur Hays Sulzberger, of New York, and Mr. and Mrs. Milton B. Ochs, of Chattanooga, Tenn. They spent their visit at Mr. Sensenbrenner's country estate on Lake Winnebago.

Arthur Bouffard, who has been instructing classes in pulp and paper making in the Fox River Valley mills for the last three years, has resigned and will take up rehabilitation work in Brown county, Wis. Mr. Bouffard had his headquarters at Appleton and was employed by the vocational schools in paper mill instruction.

Manufacture of bond business papers in pastel shades has been started by the Whiting-Plover Paper Company, Stevens Point, Wis., according to announcement of E. A. Oberweiser, president. The paper is now being made in fern, peach, melon, sapphire and lavender. "The popularity of pastel shades in home and office furnishings is well known," said Mr. Oberweiser in commenting on the change. "Even men's clothing shows a tendency in that direction. We have noted these trends and decided to capitalize on them by supplying our bond paper in the more popular shades."

Refund for a $28,964.45 over-assessment will be made to the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., by the U. S. treasury department. The reduction was allowed on its income and profits taxes for 1918 on the grounds a re-examination of the company's books showed the earlier audit understated the invested capital.

DOWNINGTOWN



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Demand for Paper Improves In Philadelphia

Fine Paper Market Exhibits Stronger Undertone Than of Late, With Writing and Book Papers In Better Request—Kraft Wrapping Paper Going Forward In Fairly Satisfactory Volume—Hot Weather Specialties Seasonally Active

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., August 17, 1931.—While the vacation days do not warrant an immediate upturn in business, there continues a slight improvement in some of the standard grades of paper and a seasonally active market for specialities used in hot weather. Wholesalers report growth of orders slowly progressing, with book papers in a more encouraging trend. Manufacturers report slightly better inquiries. Reports of stocks on hand show that consumers are low and will be obliged to become buyers if the slowly rising industrial activity continues. On the whole many believe that the worst is past for the paper trade. Manufacturers plan to broaden operations after the 15th of the month if present inquiries materialize in actual orders.

For the past two months there has been little interest shown in fine papers. Such grades as those used by greeting card manufacturers and for papeteries and the stationery trades, are now in better demand as purchasers are coming slowly into the market. While buying has opened up, orders are of hand-to-mouth type. Better grades of writings, book papers, and announcements are also in request. All grades of box makers papers show some improvement and with prices at attractive levels buying on a small scale has set in. Boards continue low priced and dormant. Builders supplies are among the summer laggards that now indicate more attention on the buyers side of the present day paper trading. Prices are steady.

There was some improvement indicated in wrapping paper. The hot weather has retarded manufacturing, and dullness in the mercantile trade, of the usual summer type has kept demand at a minimum. Gummed papers and tissues show improvement, while krafts are moving in slightly larger volume. Specialties continue to be the most dependable of summer sellers as hot weather supplies are the most sought of, and are of normal consumption. Bags are steady and hold at the higher prices. Cellophane, and cellophaned window bags continue active.

There has been some revision in prices of rags but paper stocks hold at the lower levels to which they were reduced a month ago. All grades of silesias are moving and wiping rags have a fair demand but other rags are draggy. Reductions are fractional. Better grades of paper stock are sparse while wholesalers are showing no interest in lower grades having plenty on hand to meet any emergency. In the better grades of paper stock there is some activity but demand is not anywhere near normal for this season. Roofing rags indicate the dullness in the building trades. Inquiries from fine paper manufacturers for better grades of paper stock are growing but few have materialized in actual orders so far.

Penn Paper and Stock Co. Rebuilding

Following the fire which destroyed building and stock to the extent of $50,000 damages, the Penn Paper and Stock Company, 504 North American street, is now engaged in rebuilding both its paper headquarters and its converting departments housed under the same roof. The entire flooring of the five story structure is being relaid with double floors of maple for reinforcement to withstand the heavy machines and paper stocks maintained. The burnt walls of the buildings are being reconstructed and the buildings brought up-to-date with modern fireproof devices and materials. The entire equipment of the converting departments is being replaced with new units in cutters, rewinders and sheeters for converting large paper supplies in kraft and news print into sheets and rolls. The entire equipment is being installed by the Moore & White Company, manufacturers of paper machinery, 15th street and Lehigh avenue.

The Penn Paper and Stock Company converts in large quantities damaged or special lot purchases of kraft and news print into roll and sheet products of various sizes. It specializes in carload lots. The Penn Paper and Stock Company, of which William J. McGarity, Sr., is head, is the former Bicking Paper Company, one of the oldest wrapping paper and news print houses in the Quaker City trade and was formerly owned by the members of the Bicking Paper Mills at Downingtown, Pa. When the reconstruction is completed the firm will have a modern paper house with every modern device for converting into roll and sheet products, with speed and perfection of workmanship, especially designed by the Moore & White engineers.

Norbert A. Considine Returns from Tour

President Norbert A. Considine, of the Paper House of Pennsylvania, 32 North 6th street, who has been spending the past three weeks in a tour of New England and Canada, as far as Quebec, has returned to his desk. While the trip was chiefly a pleasure one, he made a couple of stops at New England mills *en route*.

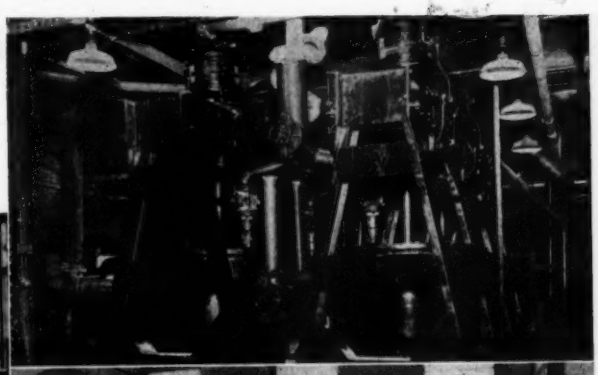
Thos. W. Price Co. Adds Greeting Cards

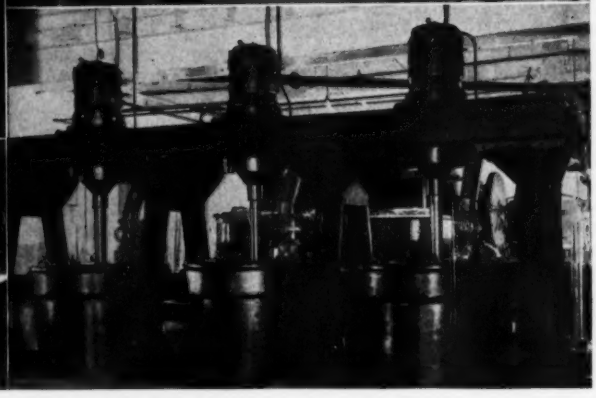
The fine paper distributors, Thomas W. Price Company, 503 Ludlow street, has added the entire line of greeting cards manufactured by Sydney J. Burgoyne and Sons, 22nd and Allegheny streets, this city. The Price company will be exclusive distributors of the Burgoyne lines in Philadelphia and adjacent territory. The Burgoyne cards are the highest class of hand engraved and steel etching cards obtainable and have a national distribution where better greeting cards are sold. There are 71 designs in the assortment of business and social greetings and a box assortment retailing for $1 which entails a profit of 100 per cent to dealers and agents.

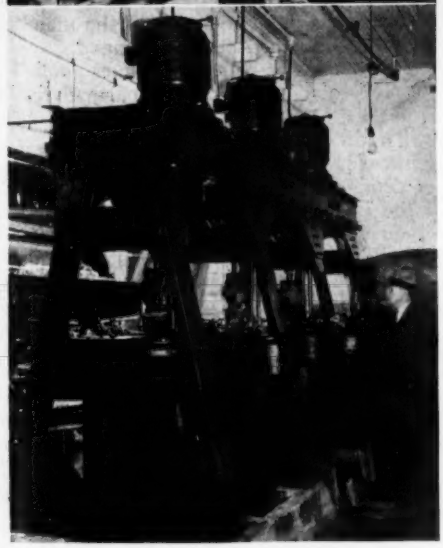
Plans for Franklin Memorial Paper Exhibit

Having been alloted space in the $6,000,000 Benjamin Franklin Memorial now under construction on the Parkway, which will be given over to permanent displays of working models of American industries and business enterprises, as a great industrial exhibition and center where these may be laid before the world for inspection or study by visitors or students from all parts of the globe, the paper industry is to be a prominent part of the perpetual exhibits. The committee has been given the architect's plans showing the assignment to the paper trade of 5,000 square feet of space in which will be erected a working miniature model of a paper mill. A blue print has been drawn up showing the small paper machine which will be be erected and this will be given further consideration at a later meeting of the group of paper men who are on

Can these mills —and dozens of others—







be Wrong?

It's not through accident, or super-salesmanship, that Tolhurst Centrifugals are cleaning stock in so many of the Country's finest mills. Sound judgment, based on results, put them there.

Performance data . . . dirt counts . . . finishing department records . . . sales records . . . *all prove that it pays to make clean paper with Tolhurst Centrifugals.*

May we put these facts in your hands? Write.

TOLHURST MACHINE WORKS, Inc.
653 W. FULTON STREET, TROY, NEW YORK

TOLHURST
REGISTERED U.S. PAT. OFF.
Centrifugals

Tolhurst Paper Centrifugals are manufactured under license from the Centrifugal Engineering & Patents Corp., owners of the Erkenastor patents.

5022

the committee, as follows: Colonel Benjamin Franklin, Strathmore Paper Company, West Springfield, Mass.; Grellet Collins, Dill and Collins Paper Company, Philadelphia; George W. Ward, D. L. Ward Paper Company, Philadelphia; and Norbert A. Considine, of the Paper House of Pennsylvania, Philadelphia. The Paper Industry Exhibit will adjoin that of the Graphic Arts, which will be a most important part of the industrial displays, because of the association of Benjamin Franklin with those arts and the part he played in the history of American printing and publishing as well as paper making and its development.

New Jessup and Moore Line

There has been added to the stocks of the Charles Beck Paper Company, 401 North Broad street, a line of colored book papers of low prices. The line is known as the Britone and is of laid antique, in bright hues and white. It comes in two weights and is the newest of papers to be marketed by the Jessup and Moore Paper Company, of this city, and mills in Delaware. The Charles Beck Paper Company is Philadelphia agent for the Britone.

Dill & Collins to Exhibit

Various lines of fine paper adapted for direct mail use will be exhibited at the coming national convention of the Direct Mail Advertisers Association to be held at the Statler Hotel in Buffalo, October 7, 8 and 9, by the Quaker City manufacturers, Dill and Collins Company, Richmond and Tioga streets. W. R. Kortkamp, advertising manager, will be in direct charge of the exhibit and will represent the Dill & Collins company at the Convention.

Select Direct Mail Leaders Exhibit

The new 1931 exhibit of the fifty best specimens of direct mail campaigns conducted throughout the past year has been completed and is ready for exhibition at the coming Direct Mail Advertisers Convention. It was, as in former years, selected from the direct mail campaigns conducted by leading national mail advertisers in the United States and Canada. The campaign this year has been conducted under auspices of the Direct Mail Advertisers Association, although it originally, and in the past ten years or so of its inception, has been assembled and sponored by George W. Ward, of the D. L. Ward Paper Company, chairman of the educational committee of the Direct Mail Association. Those on the committee who selected the fifty specimens that will be awarded the 1931 prizes to be shown at the convention and later at the Poor Richard Club, where the compilers of the Direct Mail Leaders Exhibit will talk and explain the ad matter, are George W. Ward; Homer J. Buckley, Chicago; Tim Thrift, Elmira; Leonard Raymond, Boston; and W. R. Ewald, D. L. Ward Company, who were also the judges in selection of the Direct Mail Leaders. Mr. Ward will bring the Direct Mail Leaders Exhibit to Philadelphia in October immediately after the showing at the mail convention.

Enterprise Paper Co. Acquires Agency

Agency for the line of coat hangers used by the clothing and dry cleaning industries and made by the Andrew A. Ruen Company, Detroit, has been acquired by the Enterprise Paper Company, 3rd and Callowhill streets. The local distributors of the Ruen products will have exclusive rights in Pennsylvania, Delaware, Maryland and New Jersey for the wholesale sales of these accessories.

Paramount to Develop Cellophane Line

The Paramount Paper Products Company, Inc., 3rd and Callowhill streets, manufacturers of bags and glassine products, is now working on a new line of products to include Cellophane and Cellophane combination with paper in manufacturing of converted specialties. The machines are now under construction and the head of the firm, Nathan Isen, hopes to have present plans perfected by Fall when the Cellophane will supplement the lines of coffee, and other food product bags which already are manufactured.

Paper Mfrs. New Plant Completed

With the return of Frank A. O'Neil, head of the Paper Manufacturers Company, from a two month sojourn in Europe, the new plant of the company, just completed on the site adjoining the old quarters at 5th and Willow streets, will be ready for operation. The head of the company will be back at his desk by August 25. The new quarters, which were designed to correspond with the larger structure erected a few years ago, will be devoted to production of gummed papers, such as tape, stay papers, and gummed sheet papers; the latter the latest addition to the gummed converting lines of the Paper Manufacturers Company. The building is already completed.

A. M. Collins Mfg. Co. at Direct Mail Exhibit

At the convention of Direct Mail Advertisers Association, to be held in Buffalo, in October, there will be shown the complete assortment of papers manufactured by the A. M. Collins Manufacturing Company, 1518 Walnut street, for use in direct mail advertising and correspondence. Among the assortment will be the latest addition to the line which will be introduced next month in cover paper to link with the present papers of the A. M. Collins Manufacturing Company.

Indianapolis Paper Demand Draggy

INDIANAPOLIS, Ind., August 17, 1931.—With the exception of seasonal merchandise, the paper market here is rather draggy. Buyers are holding off until the last minute and in face of a rather indifferent demand from the ultimate consumer just at this time, the dealers are not buying to any marked degree. All stocks, both in wholesale and dealers hands are being kept at as low a point as possible. Dealers are beginning to take cognizance of the fact that the school season opens early next month. There will be some good buying of fine papers before the end of the month.

The summer specialties continue to go well in spite of a cool wave during the past week which relieved the state from abnormal temperatures that had prevailed for three weeks. However, stocks in retail hands were so depleted, buying during the past week continued and the manufacturers and jobbers reported a continued demand.

Demand for all water-proof papers continues good. The market has been very active all summer, particularly the confectionery and the bakery demand. Demand for cellophane is somewhat off just at present due to indifferent business among the cigar manufacturers of the state. The wrapping paper demand is slow, but should pick up with the opening of the fall season. Bags seem to be moving slightly better than wrapping papers.

The prices of building papers now are about down to the pre-war level. Demand is far off and there is little prospect of any increase during the fall season. At least local dealers do not look for any and architects say they feel the same. This has been one of the poorest years this city has had in new construction for some time.

Manufacturers of corrugated board and paper containers in this state also have suffered. Most of the board mills are working two or three days a week and report difficulty in disposing of their stocks. The container factories, however, are slightly better situated and are working three and four days a week.

Jones

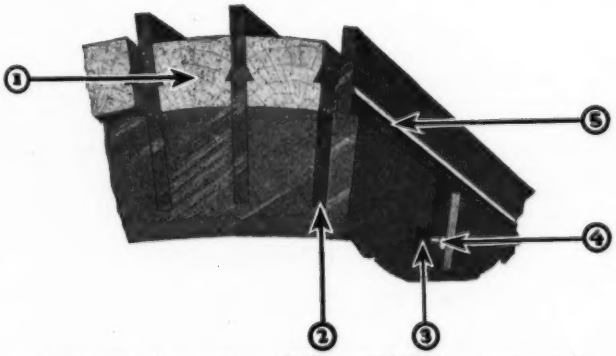
A NAME THAT HAS WON A WORLD-WIDE REPUTATION THROUGH 75 YEARS DEVOTED TO PAPER - MAKING PROGRESS

• THE JONES *Bandless Type* PLUG

Is simple in design, rigid in construction, and presents the utmost ease in refilling. Here is a Bandless Plug that can be supplied with any thickness bar or any spacing desired. This plug has proved successful, over a period of years, in mills running it under the severest conditions.

JONES BANDLESS PLUG

HERE ARE THE FEATURES . . . .



Further information gladly mailed upon request.

1. **Straight grained, air seasoned Oak fillers—easy for chipping. Maximum life to meet severe service.**
2. **Deep milled slots—giving lateral support for the bar its entire length—maximum rigidity.**
3. **Back Groove to receive pin. Bars need not be driven entire length to be removed or replaced.**
4. **Pin Bar Lock—five pins in each bar.**
5. **Bead to lock woods in place—bead interlocks with woods to prevent them raising.**

REFILLINGS FURNISHED AT SAME PRICE AS THE BANDED TYPE.

E. D. JONES & SONS COMPANY

PITTSFIELD . . . . MASSACHUSETTS

BUILDERS OF HIGH-GRADE MACHINERY FOR PAPER MILLS

A Veteran Roll Grinding Expert

The year of the big blizzard, 1888, marks a milestone in the career of many a New Englander. It was in that year that Richard Gillis first started to work in the roll grinding department of the then Farrel Foundry and Machine Company, now the Farrel-Birmingham Company, Inc., of Ansonia, Conn., says *Abrasive Industry*.

In the intervening 42 years Mr. Gillis has witnessed many changes in roll grinding practices and the small grinding department employing five small machines, where he first started as an apprentice, has grown to one where 30 large roll grinding machines are now operating under his direction.

In the old days there were no automatic devices for producing the proper crown or concavity on chilled iron rolls for paper, rubber and metal working, and the operation was considered somewhat in the nature of a craft secret. By close observation Mr. Gillis learned the methods, which at that time consisted of blocking up the neck rests so that the wheels would cut heavier on the ends, grinding a taper to the center. It was a slow "cut and try" process, blocks of varying sizes being used until the one producing approximately the desired amount of crown was found.

This method of shaping rolls was later discarded and there came into vogue the technique of applying the curvature by hand feeding of the wheels in such a manner that, starting with a heavy cut on the ends, gradual wear of the wheels caused progressively lighter cuts to be taken up to the center, thus producing the curve desired. This method also required considerable skill on the part of the operators, some of whom, like Mr. Gillis, became very expert, developing almost a sixth sense in the grinding of crowned rolls.

Gradual developments in roll grinding machines brought about successively the forming bar attached to the side of the grinder bed, which imparted the shape of the bar to the roll, and the Farrel cam-type crowning and concaving device now in use, which automatically produces a mathematically exact curve of correct shape.

Mr. Gillis has seen the requirements for accuracy and finish grow more exacting with the passing of the years. When he first started to work there were no instruments to gauge, with the exactness now demanded, the straightness of rolls or the accuracy of the crown or concavity. For crowned rolls the main dependence was the "light test" (placing rolls in a stack and determining how closely they matched each other by the amount of light that was perceptible between them), and Mr. Gillis can remember when it sometimes took considerable time and a number of trials to pass a roll with this test, oftentimes several grindings being necessary to obtain the correct shape. This is a decided contrast with present practice, which with modern equipment and the recorded experience of many years, permits of grinding rolls so that except in rare cases they will pass the light test the first time. And this means a pretty fine tolerance on, for instance, a bottom paper calendar roll 36 inches in diameter by 298 inches face, weighing 52 tons.

Forty years ago roll grinding, except for the crowning of rolls, was hardly more than a rough polishing operation and it was not until some time later that it took on the character of a real machining and finishing operation. Even then the finish was far from the quality required today. In many cases lathe tool marks were tolerated, while now wheel feed marks are hardly permissible and for some purposes rolls must be ground to a high mirror finish without a single trace of a mark that may mar the finished sheet.

Mr. Gillis' skill, knowledge and experience have been utilized by many paper mills and other roll users all over the United States and in Canada and Mexico to help them out on knotty roll grinding problems which they were unable to solve themselves. At the ago of 70 he is still hale and hearty and, although he does still go out on some particularly difficult cases, he prefers to leave the traveling and outside work to younger men and remain at home to attend to his duties as supervisor of the Farrel-Birmingham roll grinding department.

New Ludlow Multi-Valve

The Ludlow Valve Manufacturing Company, of Troy, N. Y., has just issued a catalogue devoted to its new Ludlow Multi-Valve. This valve affords a metal-on-metals seating that cuts through scale and viscous liquids and insures a positive shut-off that will not simmer. A multi-stage opening action that reduces velocity and density by successive expansion and cushioning, gives a perfect throttle without erosion.

The heart of the Ludlow Multi-Valve is the multi-stage plug or cone. This cone is corrugated with specially curved grooves in the side, forming a number of contact lands that seat against the converging wall of the outlet.

These grooves form annual expansion chambers, the area of each increasing with the circumference of the cone, thus reducing the density of the fluid step by step and forming separate back-pressure pockets which retard the flow.

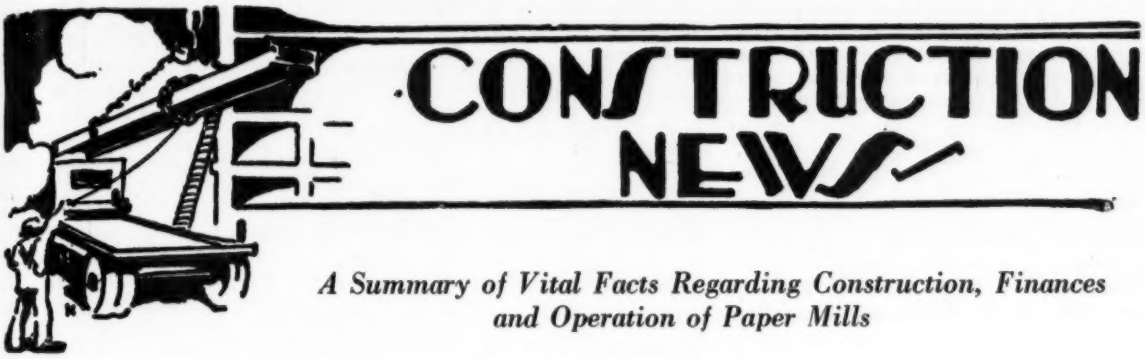
The stainless steel cone swivels on the stainless steel stem. As long as its beaded lands are in contact with the converging walls of the seat, the cone cannot revolve, but once free from the seat it rotates with the spindle. In this way, the cone continually corrects any possible leakage by presenting a new sealing surface for contact with each successive seating.

Its beaded contact lands easily cut through and crush scale and other solids without injury to these lands or the walls of the seat. Scale cannot find lodgment across the lands, and is automatically removed from the seat in the action of closing. As the lands contact with the walls, their high unit pressure creates a burnishing action which corrects blemishes or effects of scouring, or scoring, overcomes the effects of expansion and contraction, and insures maximum tightness, whether the fluid pressure is above or below the cone.

In any open position the cone is suspended within the center of the vortex and remains perfectly balanced. This prevents chattering. When fully open the top of the cone bears against the bonnet cover where it is out of the path of the flow.

May Buy Storey Parchment Co.

DETROIT, Mich., August 17, 1931.—Representatives of the Aetna Paper company, Dayton, Ohio, and of their allied mills: The Howard Paper company, Urbana, Ohio, and the Maxwell Paper company, Franklin, Ohio, are understood to be negotiating for the purchase of the machinery of the Storey Parchment company, which has been idle for some time. The citizens of Trenton, Mich., where the Storey Parchment company is located, are reported as expressing the hope that the machinery will not be removed from Trenton and that this will mean the reopening of the parchment mill, thus providing employment for many now idle.



A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Hackensack, N. J.—The C. R. Whiting Company, 287 New Jersey Railroad avenue, Newark, N. J. manufacture of fancy papers, etc., has arranged for a ten-year lease on a portion of the former mill of the Campbell Wall Paper Company, Hackensack, recently taken over by the Harper Terminal, Inc. The property totals about 22,000 square feet, and will be used by the Whiting company for a new mill. The company will install equipment at once and plans to begin production at an early date.

Manistee, Mich.—The Manistee Paper Box Company, Manistee, recently organized by Frank Fales, Saginaw, Mich., and Glenn Larsen, Manistee, has arranged for the purchase of the Manistee plant of the American Paper Box Company, Saginaw, and will take over the property at once. The plant has been idle since last May. The new owner will make a number of improvements in the plant and will begin production at an early date. It is proposed to give employment to about 30 operatives for initial manufacture.

Brewer, Me.—The Bangor Box Company, 75 South Main street, Brewer, manufacturer of folding paper boxes and other containers, has plans under way for the rebuilding of portion of plant recently destroyed by fire with loss reported over $40,000, including equipment. The new unit will be two-story and is estimated to cost close to a like sum. F. A. Patterson, 16 Central street, Bangor, Me., is architect, in charge.

Roanoke Rapids, N. C.—The Southern Paper Board Mills, Inc., recently organized, have taken over the former local mill of the Roanoke Fiber Board Company, closed for more than a year past, and will begin operations at once for the manufacture of a line of boxboard specialties. A number of improvements have been made in the mill for increased efficiency, and it is expected to develop maximum output at an early date, giving employment to a working force of about 50 persons. C. R. Karlstromer and Uno G. Fryckland, Roanoke Rapids, head the new organization.

Muskegon, Mich.—The mill of the Michigan United Paper Company was damaged by fire recently with loss reported at about $15,000. It is planned to replace the damage at an early date.

Indianapolis, Ind.—Officials of Beach & Arthur, Inc., 2900 Columbia avenue, paper products, have arranged for a reorganization of the company under present name. The capital stock in the future will be 22,500 shares of stock, no par value.

Houston, Tex.—The Texas Fibres Company, Post-Dispatch Building, Houston, is arranging for installation of equipment in a local mill for the production of fibre products, and is planning the purchase of a quantity of equipment, including bleaching kiers of high-pressure type, with loading and unloading baskets, etc.; raw stock dryers and accessory equipment; centrifugal extractors, provided with baskets for handling raw stock; retorts for gas bleaching service, with accessories; boilers, presses and allied equipment. It is understood that purchases will be made soon.

St. Paul, Minn.—Brown & Bigelow, Inc., University and Syndicate avenues, manufacturer of paper stock, advertising paper novelties, calendars, etc., has preliminary plans under way for the erection of a new addition to its plant, consisting of a three-story and basement unit to cost close to $250,000, to be equipped for the manufacture of playing cards and kindred paper stock products. It is understood that bids will be asked on general contract later in the year. Toltz, Kink & Day, Inc., Builders' Exchange Building, St. Paul, is architect and engineer. Charles A. Ward is general manager.

Los Angeles, Cal.—The new mill of the Crown-Willamette Paper Company, 343 Sansome street, San Francisco, Cal., at East Twelfth and Evergreen streets, Los Angeles, referred to in these columns last week, will be equipped for a converting plant for Southern California trade, using paper stock from the company mills at Oregon City and West Linn, Ore. The new unit will be one-story, 193 x 315 feet, and portion of the structure will be used for storage and distributing service. A two-story office building will also be erected. Entire project will cost about $300,000 and is scheduled for completion before close of year. The Austin Company, 777 East Washington street, Los Angeles, is general contractor.

New York, N. Y.—The Stemer Paper Corporation, 50 Franklin street, has arranged for an increase in capital from $25,000 to $100,000, for general expansion.

Newark, N. J.—Fire recently destroyed a one-story building at the paper storage plant of A. J. & C. Leonard, 78-80 Clifford street, Newark. An official estimate of loss has not been announced. It is proposed to replace the structure at a later date.

Philadelphia, Pa.—A new company is being organized by local interests under the name of S. Spector Company, Inc., with capital of $10,000, to manufacture and deal in paper products of various kinds. The names of the principals are temporarily withheld. The company will be represented by Kate Schectman, Philadelphia, a local attorney.

Gaspe Harbor, Que.—Fire recently damaged the Rossing mill of the International Paper Company, near Gaspe Harbor, with loss reported at close to $55,000, including equipment. No announcement has been made regarding rebuilding, and it is understood that this will not be carried out at the present time.

Marrero, La.—The Celotex Company, Chicago, Ill., is continuing its development program at its local cane fibre mills, and is arranging for commercial production of

a number of new products, including two-surface insulation boards, new type of fibre board for structural sheathing, as well as a new cane fibre lath. Effective with marketing arrangements in different parts of the country, it is expected to develop large output of the new specialties, which will be manufactured from sugar cane waste, as are the regular line of products of the company, including wallboard, etc.

Toronto, Ont.—The Liquia Fibre Company, 362 Bathurst street, Toronto, is reported planning the early erection of a new local plant to cost over $50,000, with equipment.

Carnegie, Pa.—The Superior Paper Products Company, Carnegie, has begun the construction of its proposed new local plant unit, for which general contract was recently let to the A. A. Lane Construction Company, 1869 East Fifty-fifth street, Cleveland, Ohio. It will be one-story, 80 x 185 feet, and is reported to cost over $80,000, with equipment. Superstructure will be pushed to completion. Braziell & Anderson, 309 Fourth avenue, Pittsburgh, Pa., are architects. C. J. Bausmann is president.

Boston Paper Business Normal

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 17, 1931—Business among wholesale paper dealers around the Hub has averaged normal for the season of the year. In the summer quiet dealers have been making preparations for fall campaigns, tying up with manufacturers in exploiting various lines. In general, the market has improved with the number of orders increasing, as well as inquiries. In many instances, orders have been small, but the volume is fairly satisfactory.

There is a more active demand for fine paper from printers, particularly in connection with advertising campaigns, showing the confidence which many business men have in the near future. The call for wrapping paper is fair and improving, although dealers do not look for any big boom. Textile papers are moving moderately well. Glassine manufacturers report a good movement of their product, with some mills operating to capacity.

While reports from box board dealers vary, the outlook, as a whole, is encouraging. With New England shoe production well sustained, the need for cartons continues, so that the demand for boards for this purpose has been rather lively. A number of fancy box manufacturers are now operating their plants to capacity, so that the prospect from this direction is favorable.

In paper stock, the market is still generally dull, although the improvement in old kraft continues. It is stated that there is plenty of this material available. There has been some movement in mixed papers during the week. Mixed papers continue to sell at 16 cents, and in some cases up to 20 and 22½ cents. It is intimated that there has been an urgent demand in some quarters for this commodity.

Interest in Brotherhood Election

ALBANY, N. Y., August 17, 1931.—There promises to be some opposition to those officers of the International Brotherhood of Papermakers seeking re-election at the next election in October and the local at Iroquois Falls, Ont., has endorsed a complete opposition ticket with Jeremiah T. Carey, of this city, as its choice for president. Since retiring from the office several years ago Mr. Carey has made a number of attempts to be re-elected without success. Locals in this country and Canada were given the opportunity to name their choices during the past few weeks and the official ballots for the actual voting are to be sent out next month.

OPPOSE FREIGHT RATE INCREASE

(Continued from page 15)

tonnage, which has been struggling to exist. It has recently through cuts in salaries, dismissals and shutting down of mills, effected a saving of $500,000 per annum. Should a 15 per cent increase in rates be granted, it would completely wipe out this saving and leave it in the same dangerous financial position as before—and compel it to either operate at a loss or to resort to the only remaining means of effecting economies by reducing wages.

"The paper industry is not unmindful of the fact that there is no public utility which has done more for the prosperous development of our country than the railroads, or where contacts through their employees and investors in their securities reach any where near the number of those of the railroads. It is also aware of the fact that their successful operation, affecting such large numbers of our people, must be assured—but until it shall have been established that under normal business conditions and with efficient management the railroads are unable to operate at present tariff rates and earn reasonable profits on working capital, it is our belief that the advance asked for should not be granted."

W. F. Everding Testifies

W. F. Everding, assistant traffic manager of Brown & Co., of Berlin, N. H., manufacturers of pulp-paper chemicals, artificial leather, etc., testified in opposition to the proposed increase, stating that if it were approved his company would have to turn to other than railroad transportation, a practice it has avoided in the past.

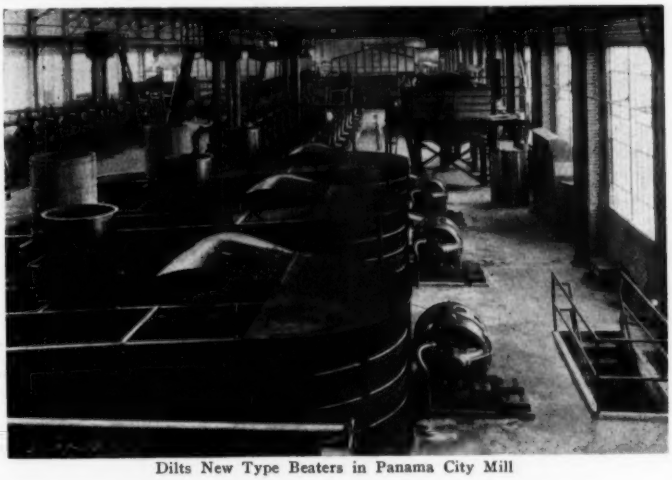
Mr. Everding asserted that $600,000 would be added to freight charges to and from his Berlin plant when the Commission's decision in the Eastern Class Rate Case became effective. He said his company had never opposed the railroads in any rate case, but that disturbance of competitive business adjustments expected to result from the 15 per cent increase made intervention at this time necessary.

To Take Over Fonda Container Co.

[FROM OUR REGULAR CORRESPONDENT]

UTICA, N. Y., August 17, 1931.—Negotiations have been completed by the Missisquoi Corporation, Sheldon Springs, Vt., for taking over the business and plant of the Fonda Container Company in this city. The latter concern is a large producer of paper containers of various kinds and caters to a trade extending to all parts of the country. The company was organized in the village of Fonda early in 1915 by the late John Ross and the steady growth of the business resulted in the removal to this city in 1922 where better manufacturing facilities were obtained. Upon the death of Mr. Ross in 1920 the concern was reorganized and has been managed by John M. Brown, of New York City, since that time.

A statement issued by the new owners revealed their intention of continuing operations at the local plant and they also expressed confidence of being able to build up a business which will necessitate enlargement. The local concern has been employing about 75 hands and it is understood that this number is to be increased. It was announced that H. E. Raymond and Walter B. Sheehan, president and treasurer, respectively, of the Missisquoi Company, will hold the same positions with the Fonda Container Company. The acquiring of the local mill by the Vermont concern is expected to afford an additional outlet for its product. It is understood that the Fonda Container Company will retain its original identity under the new ownership.



Dilts New Type Beaters in Panama City Mill

WAY DOWN SOUTH

BASTROP, Louisiana: Dilts NEW TYPE Beaters are used **exclusively** in making Kraft in the International's big four machine 280 ton mill.

HODGE, Louisiana: Dilts NEW TYPE Beaters are used **exclusively** in making the Southern Advance Bag Company's kraft paper for their 242″ machine.

BOGALUSA, Louisiana: Dilts NEW TYPE Beaters in the Bogalusa Paper Company's big 225 ton mill and model laboratories.

CAMDEN, Arkansas: Dilts NEW TYPE Beaters are used **exclusively** in handling the stock for the International's two machines, each 212″ wide.

CRICHTON, Alabama: Dilts NEW TYPE Beaters **exclusively** equip the Mobile Paper Mills, on board.

TUSCALOOSA, Alabama: Dilts NEW TYPE Beaters are used **exclusively** in the Gulf States Paper Company's new kraft bag paper mill back of their big 230″ machine.

MOBILE, Alabama: Dilts NEW TYPE Beaters are used **exclusively** in the greatest International kraft mill, 3 big 212″ machines.

PANAMA CITY, Florida: Dilts NEW TYPE Beaters are used **exclusively** in the Southern Kraft Corporation's newest mill—two 236″ machines.

—Dilts—
MACHINE WORKS, INC.
FULTON, N. Y.

"Your paper is made in your Beaters"

Dilts New Type Beaters in Camden (Ark).) Mill

New York Trade Jottings

The Paraffine Companies, Inc., report for the year ended June 30 deficit of $193,661, as compared to surplus of $674,380 for the year ended June 30, 1930.

* * *

The Gummed Tape Corporation has been incorporated under the laws of New York State, with a capital stock of 100 common shares. The attorney is H. Gilbert, 350 Madison Avenue, New York.

* * *

E. Butterworth & Co., dealers in paper mill supplies, have closed their New York offices at 1,123 Broadway, and announce that all business of the company will, henceforth, be conducted from the Boston offices at 136 Federal street.

* * *

J. L. Fearing, vice-president and sales manager of the International Paper Company, New York, announces the election of E. L. Crooker as a vice-president of the company. Mr. Crooker recently joined the sales department of the company.

* * *

United States Gypsum and subsidiaries report net income for the six months ended June 30 of $2,241,560, after depreciation, Federal taxes, and other charges, equal to $1.62 a share on 1,216,956 shares of common (par $20) after dividend requirements on the 7 per cent preferred. This compares with $2,891,750, or $2.24 a share on 1,170,370 shares of common in the first half of 1930.

* * *

The Waste Paper Institute has some important matters which it must give consideration to in the near future. These are the completion of the organization machinery, plans for a trade practice conference, the appointment of a standardization committee to meet with a similar committee from the Paperboard Industries Association to draw up a classification covering waste paper, the appointment of a number of committees, and other matters of considerable importance. Whether the Fall meeting will be held in Atlantic City or at some more central point in the Middle West has not yet been determined.

* * *

The MacAndrews & Forbes Company for the June quarter reports net profit of $212,569 after expenses, Federal taxes and company's proportion of results of operation of subsidiaries, equivalent after dividend requirements on 6 per cent preferred stock to 54 cents a share on 333,300 shares of no par common stock. This compares with $217,827, or 56 cents a share, on 335,700 common shares in the preceding quarter and $252,395, or 65 cents a share, on 339,600 common shares in the June quarter of 1930. Net profit for the six months ended June 30, 1931, amounted to $430,396 after above charges, equal to $1.10 a share on 333,300 common shares, against $508,158, or $1.31 a share, on 339,600 common shares in the first half of the previous year.

Wage Revisions at Various Mills

HUDSON FALLS, N. Y., August 17, 1931.—It was learned this week that a number of other mills connected with the International Brotherhood of Papermakers have been affected by recent wage revisions in addition to the Union Bag & Paper Co. These include the several branches of the Abitibi Paper Company where all employees are said to have received a reduction. Other plants affected are the Ontario Paper Company, Great Northern Paper Company and a mill at Thorold, Ont.

Boston Paper Trade Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., August 17, 1931.—The Cambridge Paper Box Company, Cambridge, Mass., has put up in its office and factory one of the big posters prepared by the Louis Schulman Company, New York, which reads: "Protect Your Purchase—Insist on Paper Boxes—Because Better Merchandise is Always Boxed—Boxed Merchandise is Always Better."

The Natick Box and Board Company, Natick, Mass., is making repairs on the plant, including a new roof.

Harry H. Rutter, treasurer of Rutter & McNaught, Inc., is enjoying a much needed rest at Monomy Point, Mass., accompanied by T. J. Nolan, of the Middleby Oven Company. Fishing will be the principal diversion. Monomoy Point is twelve miles below Chatham, with a few coastguards and lobster men as inhabitants. Mr. Rutter expects to return by the 24th.

Floyd H. Blackman, secretary of the D. F. Monroe Company, accompanied by his family, left Saturday for two weeks at his summer cottage at Chichester, N. H.

Edwin G. Straus, president of Artcote Papers, Inc., Irvington, N. J., who passed most of his vacation in Maine, visiting mills in that State and New Hampshire, stopped in Boston on the return trip, calling on members of the trade.

Warren L. Chace, treasurer of Stimpson & Co., Inc., who is first lieutenant in the 105th Pursuit Squadron, United States Aviation Service, is at Mitchell Field, putting in his annual tour of duty, expecting to be away about two weeks. He plans to visit Philadelphia and will stop in New York on the way back.

Chester M. Edmond, salesman for the Baird & Bartlett Company, has gone to Hampton Beach, N. H., for a two weeks' vacation.

George W. Wheelwright of Lancaster, Mass., Carl F. Woods, of Boston, and George Alpert, a Boston attorney, have been appointed receivers for the George W. Wheelwright Company. The receivers are authorized to continue the business for four months, with the privilege of applying for an extension.

Board Confirms News Print Rate

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., August 10, 1931—The Board of Railway Commissioners at Ottawa has rendered judgment confirming its order of last January fixing 27½ cents as a "reasonable" rate for the transportation of news print by the Canadian National Railways between the plant of the Ontario Paper Company at Thorold, Ont., and Chicago. The judgment follows an appeal by the Ontario Paper Company and the *Chicago Tribune*, which absorbs all the product of the Thorold mill.

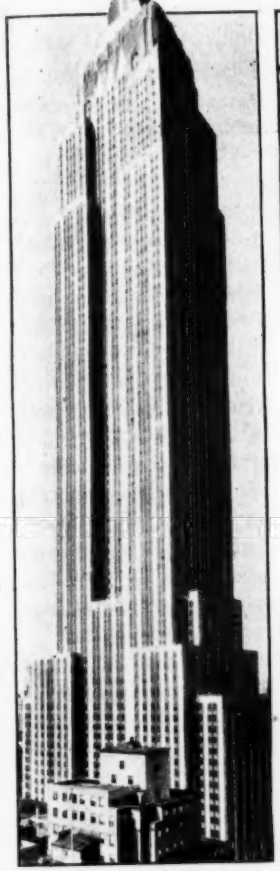
The C. N. R. had previously carried the news print on a special rate of 25 cents, this being arranged on the understanding that the railway would be used to make all deliveries for twelve months of the year and that no resort would be made in summer time to water-borne transportation. This latter provision, the railway contended, had been violated, and in view of that violation the company asked that the rate of 27½ cents be enforced. The commission concurred in the request.

Seminole Paper Corp. Chartered

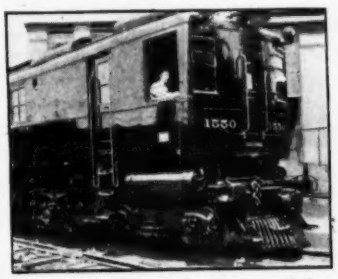
The Seminole Paper Corporation, of New York, N. Y., has been chartered under the laws of the State of Delaware, with a capital stock of $600,000; 100 shares common. The attorneys were the U. S. Corporation Company.

Gargoyle Lubricants chosen for Today's "Biggests"

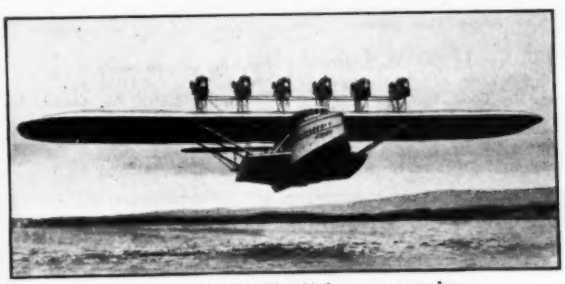
The Hudson River Bridge—World's longest-span suspension bridge—all construction machinery correctly lubricated



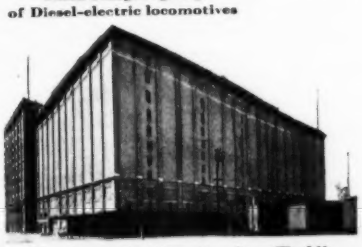
Construction of Empire State Building—World's tallest building



N. Y. Central Diesel-electric—one of the world's largest group of Diesel-electric locomotives



The Dornier Do-X—World's largest monoplane

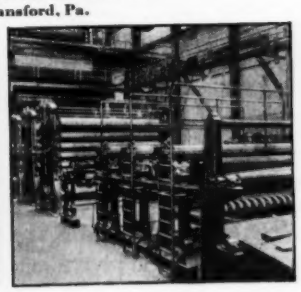


Merchant's Refrigerating Co.—World's largest cold storage plant

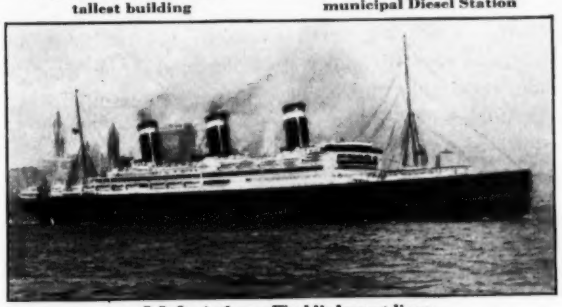
Largest American Coal Breaker at Lansford, Pa.

Freeport N.Y. Municipal Power Station—Largest U. S. municipal Diesel Station

25,000-h.p. Nordberg—World's largest uniflow engine



World's largest paper-board machine



S.S. Leviathan—World's largest liner

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ESTABLISHED 1872

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FOREIGN PAPER TRADE FOR SIX MONTHS

The aggregate value of exports of paper and paper products from the United States during the first six months of the current year totalled $12,125,865, which a comparison with the preceding six months' period reveals as representing a decrease of 12 per cent and with the corresponding period in 1930, a decrease of 27 per cent, according to the Paper Division of the Department of Commerce. Lower prices on many lines brought about a greater proportionate loss in value than in volume, the exports of wrapping paper, for instance, decreasing 41 per cent in value, while declining only 31 per cent in volume. The following percentages are indicative of losses in value of other items whose exports suffered declines in the period under review, as compared with the same period last year: Book paper, not coated, 53 per cent; newsprint fiber insulating lath or board and surface-coated papers, each 40 per cent; tissue and crepe papers, 45 per cent; papeteries (fancy writings), 42 per cent; other writing paper, 38 per cent; boxes and cartons, envelopes, vulcanized fiber sheets, strips, rods and tubes, blotting paper, cover paper and wall board of paper or pulp, from 30 to 35 per cent; paper hangings (wall paper), sheathing and building paper, filing folders, index cards and other office forms, and paper towels and napkins, from 21 to 25 per cent; box board (paperboard and strawboard), 17 per cent; other paper board, and bristols and bristol, each, approximately 11 per cent, while our exports of toilet paper and overissue and old newspapers were practically the same as in the first half of 1930.

American exporters of greaseproof and waterproof papers were instrumental in practically doubling the total value of exports of these papers in the first half of the year, as compared with the same period last year, and also in surpassing the preceding six months' record by 20 per cent. This is one of only two items in the paper products group whose exports have not only held their own during the world-wide depression, but have greatly flourished. The other item falling in this category being cash register and adding machine paper, the exports of which increased 25 per cent during the first six months as compared with the same period last year and more than doubled as compared with the six months' period ending December 1930. An 8 per cent increase in our exports of paper bags completes the picture so far as being able to make a more favorable showing during the first six months' period of this year than last year is concerned. In value American sales of paper base stocks to foreign countries declined 36 per cent during the period under review, as compared with the corresponding period last year, this loss being absorbed by the individual items under this grouping as follows: Pulpwoods, 64 per cent; other wood pulp, 68 per cent; soda wood pulp, 54 per cent; sulphite wood pulp, 5 per cent; and rags and other paper stock, 27 per cent.

Imports of paper and paper products into the United States during the first half of the year were valued at $66,095,703, or a decrease of 12 over last year's corresponding period. The major item in this group, namely newsprint, accounted for approximately 90 per cent of this total, leaving $7,759,548 for the other items under this heading, as against $8,911,371 in the first half of 1930. Newsprint imports were 8 per cent short in volume and 12 per cent in value of last year's receipts during the first six months. Next to newsprint ,the most prominent item in this group at the present time is cigarette paper, cigarette books, and covers, the imports of which ran up to $3,571,879, during the first half of the year, or an increase of 58 per cent over the same period last year. With the other exception of other wrapping paper, whose imports were slightly higher, our imports of paper and paper products declined, and rather heavily in the case of greaseproof and waterproof papers, Kraft wrapping paper, writing and drawing papers, surface coated papers, pulp board in rolls, hanging paper (wall paper), paper boxes, papier-mâché and pulp manufacturers, n.e.s., and paper board, pulp board, n.e.s. and cardboard.

Incoming shipments of paper base stocks into the United States during the first half of the year were 36 per cent lower in value than in the same period last year, the heaviest decrease occurring in imports of sulphate wood pulp, bleached, which registered a loss of 121 per cent, while imports of rags for paper stock declined 78 per cent; sulphate wood pulp, unbleached, 46 per cent; sulphite wood pulp, unbleached, 25 per cent; rough spruce, 70 per cent, and peeled spruce, 43 per cent.

DIVIDENDS BY PAPER FIRMS

Dividends paid by paper companies in July amounted to $2,842,005, according to the Standard Statistics Company, of New York.

Total cash dividend payments made by domestic corporations in July were $516,095,367.

Paper and Pulp Industry in June

According to identical mill reports to the statistical department of the American Paper and Pulp Association from members and cooperating organizations, the daily average of total paper production in June decreased 1 per cent under May and was nine per cent under June 1930. The daily average wood pulp production in June was 5 per cent below May 1931, and 14 per cent under June 1930.

Compared with June a year ago, the daily average production registered a decrease in the following grades: News print, uncoated book, bag, paper board, writing, and building papers. Compared with May 1931, the following percentage decreases were registered in the daily average production: Uncoated book, 1 per cent; paperboard, 1.9 per cent; wrapping, 0.9 per cent; bag, 1.3 per cent; and writing 4.5 per cent.

The six months' cumulative total of production of paper was 11.3 per cent below the corresponding period in 1930 while shipments were 10.5 per cent smaller than a year ago. All the major grades of paper have shown improvement at the end of the six-month period as compared with the end of five-month period.

The six months' cumulative total of wood pulp production for this year was reported as 18.7 per cent below the level of the same period in 1930.

Total shipments of wood pulp to the outside market were 29 per cent below the level of the six months' total of 1930. Bleached sulphite, mitscherlich and kraft pulp shipments to the open market were greater than in the first six months of 1930.

Total wood pulp inventories showed a continued decrease and at the end of June, were 27 per cent below the level of June 1930. All grades, except mitscherlich pulp, showed inventories below the level of June 1930.

REPORT OF PAPER OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF JUNE, 1931

Grade	Production tons	Shipments tons	Stocks on hand end of month tons
News print	101,086	100,087	33,906
Book, Uncoated	76,136	75,714	48,297
Paper board	155,843	154,930	62,760
Wrapping	44,289	43,551	43,308
Bag	12,115	11,858	6,250
Writing, etc.	23,491	22,717	50,180
Tissue	6,028	6,009	4,463
Hanging	3,935	3,783	4,353
Building	5,920	5,506	3,037
Other Grades	15,785	16,139	13,919
Total, All Grades, June 1931	444,628	440,294	270,473
Total, All Grades, 6 Mos. 1931	2,668,813	2,663,764	270,473
Total, All Grades, 6 Mos. 1930	3,009,591	2,976,645	270,066

REPORT OF WOOD PULP OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF JUNE, 1931

Grade	Production tons	Used during month tons	Shipped during month tons	Stocks on hand end of month tons
Ground wood	80,034	76,844	1,277	75,040
Sulphite News Grade	28,530	27,609	597	5,036
Sulphite Bleached	19,524	16,858	2,182	2,993
Sulphite Easy Bleaching	2,675	2,427	48	896
Sulphite Mitscherlich	3,070	2,025	622	1,855
Kraft Pulp	28,274	24,734	4,768	5,970
Soda Pulp	16,169	13,018	2,993	3,002
Pulp—Other Grades	387	321	68	101
Total, All Grades June 1931	178,663	163,836	12,555	94,893
Total, All Grades, 6 Mos. 1931	1,060,978	946,097	90,513	94,893
Total, All Grades, 6 Mos. 1930	1,305,745	1,112,930	127,655	130,008

Finnish Paper Market Unsettled

WASHINGTON, D. C., August 12, 1931—The Finnish paper market is generally unsettled, but prices are being maintained, according to a radiogram from Commercial Attache Watson, at Helsingfors. Kraft producers are in a somewhat better position than those producing other classes of paper.

E. H. Mayo Leaves Southern Kraft

E. H. Mayo has resigned as production manager of the Eastern Division of the Southern Kraft Corporation and will take a long and much needed rest.

Mr. Mayo originally went South from Michigan in February, 1911, accepting a position with the Yellow Pine Paper Mill, Orange, Texas, where there was a small mill in more or less of a dilapidated condition making thirteen tons daily production of waterfinished paper, using the soda pulp system. After he had been with this company for about six months, he persuaded them to let him convert the soda mill to the sulphate system, where the first Kraft paper was made from longleaf yellow pine in this section of the country. During the time he was employed by Yellow Pine he brought the production of this mill up from thirteen tons to thirty tons per day.

He was connected with the Yellow Pine Mill two and one-half years, during which time the Southern Paper Company's mill was being built. When the time came to start the Southern Paper Mill he was asked to come and take charge as general superintendent, and after being with them for six months he was made general manager, which position he held until the International Paper Company bought out the Southern Paper Company.

After the Southern Paper Company's mill was sold to International he became production manager of the three mills West of the Mississippi River (Camden, Bastrop and Louisiana Mills) together with the Moss Point and Mobile Mills, but since comencing construction on the Panama City Mill they found there was too much work for one man to handle and divided the Mills West of the River, putting a man in charge of those Mills, and made Mr. Mayo production manager of the Mobile, Moss Point and Panama City Mills.

In November, 1930, Mr. Mayo tendered his resignation as production manager of the Eastern Division of Southern Kraft Corporation, to take effect January 1, 1931. His resignation was not accepted, and he was persuaded to stay with the company until such time as their Panama City Mill was put in first class operating condition making Fourdrinier fiber board. The Panama City Mill has been operating very satisfactorily for the past two months, and July 1 he again tendered his resignation to take effect August 1 at which time he will sever his connection with the company with the intention of retiring.

Germany Leads in Reforestation

GLENS FALLS, N. Y., August 17, 1931.—In an address before members of the Chamber of Commerce this week, Thomas C. Luther, veteran reforestation expert, declared that Germany is far ahead of all other nations with the possible exception of France in carrying out reforestation projects. From experience gained through his own efforts at the Luther forests near Saratoga, it is his opinion that if woodlands are scientifically handled there will never be a timber famine in this country. Mr. Luther, who returned recently from a tour of Europe, declared that the Black Forest in Germany is the most beautiful in the world but he believes that timber tracts in this state may compete with it if the correct methods are followed. It was brought out that the reforestation movement in Germany was started about 300 years ago when the need for preserving the forests was discovered.

Regarding his own development, he said that the project was originated by his father about twenty years ago as a hobby. He declared, however, that it has proven a very profitable investment and there is now several thousand acres of reforested land included in the project.

(No. 6 of a series of advertisements tracing the development and uses of modern chemicals.)

HIGH SPOTS IN CHEMICAL HISTORY

Mixing plant of Jersey City Water Works which was the center of the famous legal battle of 1908. It was developed in this suit brought by Jersey City against the Jersey City Water Co. that water treated by bleaching powder was sterile and entirely safe. This view of the first large installation in the U. S. for chlorinating city water shows Mathieson Bleaching Powder being added to mixing tanks originally installed by Col. Geo. A. Johnson.

Battery of Mathieson Liquid Chlorine cylinders used for supplementary chlorination at the Jersey City Water Works.

WATER PURIFICATION

TWENTY-THREE years ago, the summer of 1908, saw the opening of a famous trial in American history. Scientific men and municipal officials from all over the world discussed it with increasing interest... came to the crowded court-room and gave ten volumes of expert opinion... proved beyond question that the first large American installation for purifying city water with bleaching powder was both safe and practicable.

About this time liquefied chlorine gas came on the market, and within two years after the installation of the first treating tanks at Boonton, New Jersey, several municipalities had started applying liquid chlorine. The use of liquid chlorine for large scale application has constantly widened because it is more economical and provides a more uniform dosage than bleaching powder.

More recently, the ammonia-chlorine process has made it possible to eliminate one of the oldest bugaboos associated with chemically treated water... the presence of certain phenolic and chlorinous odors and tastes. Pre-ammoniation increases the efficiency of chlorination, helps prevent algae and after-growths in distributing systems and may be employed at unusually low cost.

COL. GEORGE A. JOHNSON
widely known sanitation engineer.

• • •

As one of the oldest producers and distributors of bleaching powder, chlorine and ammonia, Mathieson has had the privilege of cooperating with many leading water works officials in supplying these essential chemicals for water purification. H T H, the concentrated calcium hypochlorite now used so extensively in the sanitation field, was developed by Mathieson chemists and engineers and made available to industry by the Mathieson organization.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Effect of Air Treatment on Jack Pine Chips to Overcome Pitch Trouble

By Otto Kress[1] and E. R. Laughlin[2]

Coniferous woods with the exception of the so-called dry woods such as hemlock or tamarack contain so much pitch or resin that they cannot be used for the manufacture of ground wood or sulphite pulp, unless they have been aged after cutting for a period of at least six months. Naturally these woods are suitable for reduction by the soda or sulphate processes as here the pulping agents are alkaline in nature, and any possible pitch trouble is overcome by saponification of the resins during the pulping operation.

Some of the coniferous woods such as jack pine and certain of the southern pines are so high in resin content that even prolonged storage does not overcome the pitch trouble and these woods are in general considered unsuitable for the production of sulphite pulp.

Pitch trouble manifests itself by the collection of the particles of pitch on the wire of the paper machine, and when an open mesh of the wire is sealed, holes appear in the finished paper. This necessitates the shutting down of the machine and the removal of the spot by steaming the wire or brushing with kerosene. Analysis of the pulp is no criterion as to whether a given shipment will produce this trouble and it is common knowledge that a pulp with a high ether extract does not necessarily give trouble on the paper machine. Only by actually running the pulp over the machine for a period of time will pitch trouble occur, if the pitch is in such a condition that the small particles will gather in lumps or rolls or fill an open mesh of the wire.

One of the authors had the experience of being forced to grind freshly cut balsam wood and experienced the expected pitch trouble from such a procedure in the manufacture of hanging and news, but the pulp on analysis did not show an abnormal pitch content. The same experience occurred with a Mitscherlich pulp used in the manufacture of glassine and again analysis showed a normal pitch content, but the wood from which the pulp was made was freshly cut and not seasoned.

We believe therefore that the pitch content as ordinarily determined does not vary appreciably, but that during the seasoning of the wood the pitch is oxidized, thereby losing its tacky nature, so that the small particles do not tend to gather into larger sized particles, which in time build up to a size to offer trouble on the paper machine. We believe that with properly seasoned wood the pitch, while it is not destroyed by sulphite pulping, is now in a physical condition that might be compared to a filler, and in this way the tendency for the minute particles to agglomerate, is not present.

[1] Technical director, Institute of Paper Chemistry, Appleton, Wis.
[2] Pennsylvania Salt Manufacturing Co., Research Fellow, Institute of Paper Chemistry, Appleton, Wis.

Methods of Removing Pitch

Many ways have been proposed to overcome pitch trouble and aside from the seasoning of the wood, which has been found to be most suitable, the proper washing of the pulp with hot water directly after blowing into the blow pit from the digester is probably the best. The warmer the water the better the result secured.

Preliminary steaming of the wood in the digester, the partial replacement of the lime or magnesia by soda in the cooking liquor, pretreatment of the wood with solvents to remove resins, are only a few of the ideas that have been advanced or patented to overcome pitch trouble in the finished pulp. Aside from proper ageing of the wood, none of the methods proposed are in use for overcoming pitch trouble in sulphite pulp. The best way from a practical standpoint of overcoming pitch trouble after the pulp is produced, and known from experience to one of the authors to be practical, is the addition to the beater of from 5-10 pounds of Bentonite or Wilkenite clay per 1000 pounds of stock. The clay, which is very colloidal in nature, must be thoroughly broken down in a smaller power driven kneader till entirely free from lumps. It will then largely reduce, but not entirely overcome trouble from pitchy stock. It is the author's belief that the colloidal clay covers or coats the individual pitch particles, thus preventing their coalescing to form larger sized particles, which would offer trouble.

Assuming that pitch trouble in sulphite pulp can best be minimized through ageing of the wood in the yard for a period of at least six months and preferably eight to ten months, and using wood piles in proper rotation to avoid loss through rot or decay, three possibilities present themselves as to the actual changes which occur in the wood during such storage.

1. The physical change in the pitch from a soft sticky material, such as will tend to collect into larger sized particles and cause trouble on the paper machine, might be accounted for by the loss through evaporation or volatilization of lower melting or boiling point compounds of the nature of turpentine, to the extent that the residue would be less tacky in nature with less tendency for the gathering into lumps of the pitch residue. Since no evidence that this occurs is available, this theory may be discarded.

2. It is possible to conceive that during storage, polymerization of certain constituents in the pitch occurs, so that the final product is less tacky, thereby reducing the trouble in the finished sulphite pulp. Again no evidence is available to substantiate the theory

that the constituents of the resin, which produce the so called pitch trouble, polymerize.

3. Pulp wood either rossed or in the rough, when stored in piles, slowly dried through loss of moisture, and we believe that as the moisture leaves the wood, air replaces the water, so that oxidation of the pitch occurs. As the penetration by cooking liquor or loss of water or moisture occurs mainly, as end grain loss, and as the cut end of the log or bolt becomes sealed through the exudation of pitch, such seasoning is slow and requires at least six months for spruce wood. Furthermore, the wood is piled by the jammer, usually in closely adjacent piles to reduce piling space and trackage. Thus the free sweep of air to any part aside from the top of the pile is interfered with, and the seasoning and drying of the wood is retarded. It is well known that if chips which are in a more suitable physical condition for air-oxidation, are stored for a period of three weeks, such storage in so far as reduction of pitch trouble is concerned, is equivalent to a storage of about a year in log form.

Assuming that reduction of pitch trouble is directly related to the oxidation of the tacky resins or pitch in the fresh wood, it is to be expected that if the wood in chip form, say of a shattered seven eights inch chip size, is exposed to a current of air, oxidation would be very rapid, a few hours at the outside being sufficient to accomplish what occurs in the gradual drying out of stored logs over a period of perhaps six months. In case this is correct, then there would be the added advantage, that such air-blown chips would be of low moisture content, which would be desirable from the standpoint of maintaining strength of the cooking acid, as dilution by the water in the chips is reduced and a steam saving is secured from not having to heat such a large volume of water to digester pressure. Air in large volume at low pressure is not costly and a pretreating building or chamber might be installed, into which the screened chips be dropped at one end and moved gradually forward by a suitable conveyor, during which time air is blown through the chips, which would then be elevated to the chiploft with the pitch oxidized and the moisture content reduced.

In the past, chips have been treated on a commercial scale prior by blowing air through the chips while the same were passing through the various types of dryers. These dryers have been built in various forms, some of the common types being rotating shells, shelf dryers similar to grain dryers and patented forms of vertical chip dryers. Fuel gases have been bi-passed from their normal passage to the stack, utilizing in this way the heat in the furnace gases, while other chip dryers have used pre-heated air as the drying medium. The object of such chip drying, however, has been to reduce the moisture content of the wood, thus insuring more uniform pulping and saving steam in the cooking operation. Such chippers have not been used for the express purpose of reducing pitch trouble through the oxidation of the resinous material present in the wood, but for the purpose of reducing the moisture content of the chips.

Paper Machine Pitch Troubles

The ether, alcohol, and alcohol-benzene extracts of wood consist, in varying amounts depending on the solvent used, of resins and fat. It is to these latter that pitch troubles on the paper machine are generally attributed.

Schwalbe has shown[3] that the amount of resin and fat extractable from wood decreased from one-half to two-thirds through aging for 4-18 months. Richter found[4] that as the wood seasoned, the ether extract decreased and the alcohol extract increased, though the latter was insufficient to balance the loss of the former. He believed that oxidation promoted these changes.

[3] Z. Angew. Chem. 31, I (1918) 125-127.
[4] Wochbl. Papierfabr. 44 (1913) 2486.
[5] Das Harz der Nadelholzer und die Entharzung von Zellstoffen. 2nd ed. pp 26-27 (1925).
[6] Betriebskoatrolle in der Zellstoff und Papier Industrie Z. Angew. Chem. 29, 429 (1916).
[7] Canadian Journal of Research, vol. 4, no. 1, Jan. (1931).

The work of Sieber alone[5] and in conjunction with that of Schwalbe[6] has thrown much light on the nature of the extractives obtained by the use of various solvents on woods. Alcohol-benzene, while giving a greater extract than either alcohol or ether extracts from the wood substances other than resin and fat thereby making a separation of these materials more difficult. Ether extracts largely fat with more or less resin depending on extraction conditions. Alcohol extracts both fat and resin, and in addition certain substances related to lignin and sugars. In general the other extract is more concentrated in fat content (50-70 per cent), and the use of ether is advantageous because of its low boiling point.

Harold Hibbert and Bernhard Phillips have studied the nature of the resins in green and seasoned jack pine and the following is taken directly from their publication, "The nature of the resins in Jack Pine (pinus banksiana)" (7).

"Green and seasoned jack pine were found to have an average crude content of 4.58 per cent and an ether-soluble of 3.52 percent. The value of total acids present in the resin was the same in each case, but the proportion of fatty acids was greater in green wood, while the unsaponifiable matter was considerably less. The seasoned wood contained a lower percentage of fats than the green wood and a correspondingly higher percentage of resin acids. The amount of unsaponifiable, polymerized terpentic substances was also higher. There was a marked decrease in the amounts of phytosterol and "resene" in the seasoned wood."

"The isolated resin acids obtained by distillation, or esterfication, contained a high percentage of abietic acid formed by transformation of the original acids. The percentage of natural (pimaric) acids was, however, quite high in the resin acids isolated by petroleum ether and recrystallized only twice."

"A higher percentage of crystalline acids was found in the resin acids from green wood than from seasoned, due presumably to change into amorphous products during storage."

"The fatty constituents were chiefly members of the unsaturated series, present both as free acids, glycerides, or other esters. The seasoned wood contains much less linolic acid in the glycerides than green wood. Oleic acid was present in about the same proportion in both cases; linolenic was present in only very small amount. The free fatty acids had practically the same percentage composition in both green and seasoned wood."

"The amount of the total unsaturated fatty acids was higher in the glycerides and free acids from green wood than from seasoned wood. The latter was found to contain a high percentage (30.2 per cent) of oxidized acidic material in the fatty glycerides, indicating that extensive polymerization, or decomposition of some kind, had taken place in the fats present in the green wood during the time of seasoning."

"The quantities of essential oil obtained from the resins of each kind of wood were very small, amounting to 1.5 to 4.3 per cent of the total crude resins. The products showed no difference in properties, or variation in amount, with time of storage of the wood. Owing to the small amount available for investigation, only alpha-pinene could be identified, although other terpenes may possibly be present."

"The percentages of phytosterol and resene were extremely small, and were appreciably less in the seasoned than in the green wood. The amount of polymerized terpentic material found in the unsaponifiable matter was much higher in the case of the seasoned wood. This was probably due to extensive polymerization of the essential oil having taken place during the storage of the wood."

Outline of Method

Working on the assumption that the changes in fat and resin content produced in the seasoning of wood were due primarily to oxidation, the following treatment was carried out with a view to effecting oxidation by a short vigorous air treatment and there-

by decreasing the seasoning time from one of several months to one of a few hours.

A weighed sample of freshly cut jack pine in the form of small chips, cut ½ inch x ⅜ inch, was inserted in the ventilating system of a building in such a manner that air was forced through the sample at a high velocity for periods of 6 and 26 hours. The loss in moisture content was noted; ethyl alcohol, ether, petroleum ether (BP' 35-50 degrees) extractions were made, and unsaturation determined by the Hubel iodine method on the alcohol extracts. These analyses were made on the original green wood and the two treated samples.

Preparation of Sample

A small jack pine (Pinus Banksiana) was cut at Niagara, Wisconsin, and three foot section of the log, which had a diameter of 5 inches with 40 rings, was barked on a knife barker and sawed into ⅝ inch discs. Discs from each end and the center of the log were then combined and sawed into ½ x ⅜ inch blocks, which are more difficult to treat than a shattered ⅜ inch chip. The air treatment was carried out on such a sample, while for the extractions, a sample was coarsely shredded in a hand flour mill taking care not to generate any more heat than possible in order to decrease any chance for oxidation or change in resin and fat. All samples were kept in air tight containers and grinding done in such a manner as to avoid any unnecessary exposure to the air.

The moisture content of the shredded samples was determined by standard methods. The extractions were carried out on the moist wood rather than that used in determining moisture content for the obvious reason that changes in resin and fat are produced by heat. The extraction apparatus used was the standard soxhlet and 10-15 grams of moist wood were extracted at a time. Extraction time for alcohol was 3 hours, for ether 4 hours, and for petroleum ether 2½ hours. The evaporation of the solvent was carried out on a boiling water bath until only a few cc remained consisting of a little of the solvent and the water extracted. The remainder of the drying was done in an oven at 60 degrees so as to effect as little as possible the character of the extract and to prevent any volatilization. Unsaturation was determined by the standard Hubel method on the alcohol extract and is expressed as per cent of iodine, based on the bone dry sample wood, necessary to effect complete saturation.

Data on Original and Air Blown Chips, Changes in Moisture and Weights of Chips

Hours air blown	Before treatment: moist %	Before treatment: wt. gms.	After treatment: wt. gms.	After treatment: most %	Gain based on bone dry wood
No treatment....	50.3	...	...	50.3	.....
6 hours.....	50.3	562	330	10.74	14 gms. (2.5%)
26 hours.....	50.3	543	301	6.3	12 gms. (2.2%)

DATA ON EXTRACTION ON ORIGINAL AND AIR BLOWN CHIPS

Hours air blown	Ether extract per cent	Per cent decrease	Alcohol extract per cent	Per cent increase	Petroleum ether extract (fat) per cent	Per cent decrease	Unsaturation by Hubel method per cent	Per cent decrease
No. treatment	2.74	...	2.12	...	1.6	...	3.3	...
6 hours	2.06	24.8	2.70	27.3	.9	43.7	2.64	20.0
26 hours	1.81	33.9	2.80	32.0	.7	56.2	1.23	62.8

Discussion of Results

One of the most startling of the results is the decrease of moisture content of the chips after air treatment, i.e.—that by 6 and 24 hours treatment it is possible to reduce the moisture content from 50 to 10 and 6 per cent respectively. This not only shows the vigorousness of the treatment but also indicates that if oxidation occurs there is ample chance for its effectiveness. That such is the case is clearly shown in the equally startling results in the column entitled 'gain based on bone dry wood.' This means that 562 grams of wood containing 50.3 per cent moisture—that is 280 grams of bone dry wood—was treated for 6 hours. At the end of that time the moisture content of the chips was 10.74 per cent and the weight 330 grams. But 330 grams of wood containing 10.74 per cent moisture represents 294 grams of bone dry wood while the original weight was 280 grams. The gain is accountable on the basis of oxidation—i.e.—oxygen was taken on in chemical combination and caused an increase in weight. This indicates quite strongly that the change must be due to oxidation and tends to dispel any theory of volatilization or polymerization. These results were carefully checked and show that 14 gms of oxygen or 2.5 per cent entered into combination. As a matter of fact this addition was probably greater because it was impossible in the vigorous air treatment not to loose some wood in the form of sawdust clinging originally to the wet chips. The fact that in the case of the 26 hours treatment there was not quite the same gain (only 2.2 per cent as against 2.5 per cent) is entirely within the limits of experimental error and may have been due to a greater loss of sawdust. This is entirely possible considering the much longer time of treatment.

The values for ether and alcohol extracts are in accord with Richter's results showing an increase in the alcohol and a decrease in the ether extract on ageing. The per cent decrease in the latter of 25 per cent after 6 hours and 34 per cent after 26 hours, and in the fat content of 44 per cent and 56 per cent respectively indicates that such a treatment is entirely feasible.

The difference in unsaturation likewise indicates a considerable change has taken place and again points to oxidation.

The results obtained indicate that it might be feasible to air treat chips by blowing low pressure air through the chips delivered to an intermediate building, to which the screened chips are delivered, and in which the chips are slowly moved along by a suitable conveyor. After the chips have been blown the requisite time they would then be conveyed to the digester loft in the usual manner by a sucker conveyor.

The disadvantage of such a treatment would be the cost of the building and power required by the conveyors as well as for the actual blowing of the large volume of air necessary. Air at low pressure and in large volume is not expensive and the benefits to be secured might well be worth the effort and cost. No doubt through the additional handling there would be produced some fines through the breaking down of the shattered chips that would be a drawback.

The advantages of such a treatment would be the reduction and possible entire elimination of the pitch trouble on the paper machine, the use of freshly cut wood which overcomes the necessity of storage to reduce the moisture content of the wood as well as to overcome pitch trouble from the resulting pulp. The reduction of the moisture content below the present percentage that can be secured by storing wood for a period of from six months to a year would be of value, in that the dilution of the cooking liquor is avoided and a saving in steam is secured, as the volume of the total digester liquor charge is reduced and less water has to be raised to the final digester steam pressure. Green wood gives pulp of maximum strength and yield and also if the present practice of wood storage could be overcome there would be a decided saving in yield and quality as the danger of wood decay and rot with its consequent high losses would be reduced.

Crown-Willamette Gets Reparation

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 17, 1931—L. J. P. Fichthorn, an Examiner of the Interstate Commerce Commission has prepared a proposed report in the case of Crown Willamette Paper Company against the Arizona Southern Railroad Company in which he finds that ratings on paper merchandise bags, in carloads and less than carloads from Camas, Wash., West Linn, Ore., Lebanon, Ore.,and Floriston, Cal., to points in various states of the United States lying between the Pacific coast and the Mississippi river and class rates governed "thereby found inapplicable." Reparation was awarded.

Burning Waste Wood in the Pulp and Paper Industry*

By H. W. Beecher [1]

The scope of this paper preludes the citation of data applicable to any specfic case and can only touch on the essentials to good practice.

Wood waste as burned in the pulp and paper industry can be divided into two classes; first, the waste products from the wood room or wood preparation plant; and second, wood purchased from other industries for fuel in the pulp and paper plant. In all mills the wood waste available from the wood room is insufficient to supply the requirements for the production of plant steam, and must be supplemented by purchased fuel.

Because it is difficult, if not impossible, to construct furnaces to simultaneously burn wood refuse and supplemental fuels (oil - coal, or gas) under the same boiler with efficiency equal to that obtainable when the wood and supplemental fuel is independently burned under separate units, the problem in the small plant is lessened if it can economically purchase wood refuse as its supplemental fuel.

Availability of Waste Wood

In the large plant where there are a sufficient number of boiler units so that proper spares can be provided to independently burn the mill refuse, each unit can be designed and constructed for economical use of its particular fuel.

Wood refuse from sawmills in many heavily timbered communities has been over abundant and in certain communities it has been destroyed in refuse burners. The sawmill operator now realizes that in this waste he has an additional source of revenue of no small proportion and has given serious thought to plant changes reducing his own requirement to make available additional fuel for sale.

Because of the additional costs incidental to its handling and combustion, the price charged by the sawmill to their customers must be such as to permit their customer to make substantial savings by the use of this refuse.

Most of the materials so burned are prepared, transported and sold in the form of hog fuel, a mixture of sawdust, chips, shavings and the produce formed by passing larger millends, slabs and edgings through a masticator known as a "Hog".

Thermal Values of Wood Refuse

Many analyses have been made on the various wood species and these indicate there is little difference in B. t. u. content on a dry basis. The moisture content varies considerably, dependent on the season in which the log is cut, the part of the log from which the fuel is obtained, whether circular or band saws are used (Water is frequentely run on band saws for lubrication and increases the moisture content of the sawdust,) the percentage of sawdust and in the case of pulp plant woodroom refuse whether the blocks are sawn or split and whether hand or drum barkers are used in barking the wood. Some species run wetter than others.

In checking up the units in hog fuel, we can not use Dulong's formular, as apparently much of the oxygen in the wood is not combined with the hydrogen. Probably a part is in combination with hydrogen and carbon in some form of the starch or sugar group. To show the difficulties in the use of the Dulong's formula, let us take an analysis of a given wood as follows: C_s—50.3%, H_s—6.2%, O_s—43.1%, N_s—.1%, Ash—.3%. This sample has a heat content as determined by the bomb calorimeter of 9153 B.t.u. per pound, yet Dulong's formula B.t.u. = $14000C$ plus $[62{,}000\ (H - \frac{O}{8})]$ will only account for 7846 B.t.u. If we release 16.8 percent of the oxygen (equal to 38 percent of the total oxygen present) from combination with the hydrogen and consider it as free, then the remainder of the hydrogen present must be in combination with carbon in the form of hydrocarbons. If the hydrogens were all combined as Methane CH_4 we would expect 8870 B.t.u. from our wood, if as acetylene C_2H_2 10,370 B.t.u., if as ethylene C_2H_4 9,160 B.t.u. and if as ethane C_2H_6 8,850 B.t.u. Undoubtedly we could effect a balance between various hydrocarbon combinations that would check with the calorimeter determinations, but little purpose would be served thereby.

Except for a heat balance little can be gained by periodic sampling of refuse for B. t. u. as it is sufficiently within the limits of error in the other participating factors to assume a value of 8800 B. t. u. per pound of dry wood regardless of specie.

Comparatively little has been done on standardizing a method for sampling moisture determination, analysis, and B. t. u. determination for wood refuse. Through the courtesy of the Babcock & Wilcox Company samples of the woods commonly used in the Pacific Northwest were analyzed using an approved method and under like conditions, and the following table contains the results of their determinations:—

	Moisture per cent	Ash per cent	Sulphur per cent	B.t.u. per lb. dry wood
1. Kiln dried white pint shavings..	10.68	.20	.05	8,951
2. Yellow pine	57.35	1.24	trace	8,951
3. Red fir and larch	52.21	1.94	.02	8,848
4. White pine	53.27	1.14	trace	9,058
5. White fir	42.12	2.40	trace	9,051
6. Water logged hemlock	60.25	2.01	.02	8,653
7. Fir	44.50	1.68	trace	8,980
8. Fir bark	33.00	.79	trace	9,734
9. Fir	42.16	.69	trace	9,113

A comparison of the results obtained with other determinations leads us to believe, as above stated, that prophesies of expected performances can be safely made on a basis of 8800 B. t. u. per pound of dry wood for fir, cedar, hemlock, spruce or any of the varieties of pine.

It is interesting to note that there are more heat units per pound of dry fuel in the bark than in the wood and bark mixed as indicated by comparison of samples 8 and 9. The two samples were taken from the same conveyor.

It is also interesting to note that although hemlock has the universal reputation of being a poor fuel, the water logged sample on a dry basis shows within about 5 per cent of the B. t. u. content of fir.

While hemlock may on an average run slightly higher in moisture content than fir, the main reason it is considered a poorer fuel is that on a dry basis its specific gravity is less than the other woods and when it is passed through a hog its chips differ from fir in that they pack looser in the container.

Because of the low cost per 1000 B. t. u. and the bulky character of this fuel, no attempt ahs been made to buy the fuel on a weight basis. It has become the practice to buy on measurement.

As the original hog fuel was produced by hogging slabs that had formerly been sold by the cord, tests were made to determine

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Contribution of the Heat and Power Committee.
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the volume produced by hogging a cord of slabs. Many tests showed an average of 178 cubic feet of hog produced from a cord, or 128 cubic feet of piled up slabs. This figure was rounded out for convenience and 200 cubic feet of hog fuel is called a unit.

Measurement of Fuel

This is not a satisfactory way of buying fuel. The fuel consumer is interested in getting a definite number of available B. t. u. per dollar and this is not accomplished when buying on a measurement basis.

Units of hog fuel with the same moisture content can vary more than 20 per cent in weight, depending on the size and shape of shipping or measuring container—the amount of vibration to which it is subjected in the container prior to measurement—the time it has been in the container, and whether it is entirely sawdust, entirely hog fuel, shavings, or a mixture of any of these. In other words, the chief variable affecting the weight of dry wood in a unit of a given moisture content is the percentage of voids in the container.

The statement has just been made that the variation in weight per unit can be more than 20 per cent. The author has found 45 per cent moisture hog fuel weighing 3900 pounds per unit of 200 cubic feet as measured, as purchased by a consumer. In another plant the unit of 45 per cent moisture fuel weighed 4800 pounds.

Such a range of dry weights per unit when further modified by variable moisture percentages is responsible for the wide range of reported performances. When burned in the same furnaces it is possible that hog fuel costing $1.25 per unit delivered may produce more steam per dollar than hog fuel costing $.90 per unit delivered.

The high moisture content of hog fuel (a 50 per cent moisture hog fuel has as much weight of water to evaporate in the furnace as the weight of the dry fuel) causes low thermal efficiencies of boiler plants on a dry fuel basis. Where we can now expect operating efficiencies of from 78 to 84 with properly designed installations of boilers and air heaters with powdered coal-stokers or oil, the better hogged fuel installations will range between 60 and 70 per cent.

Preheated Air

Air preheaters recover some of the sensible heat from the high moisture content of the flue gases, but can not recover the major loss, the heat of vaporization.

In coal or oil burning plants from 90 to 95 per cent of the air can be preheated, while in burning hog fuel it is difficult to preheat over 80 per cent and the percentage preheated ranges from 70 to 80. This is partly due to infiltration, but largely due to the amount of cold air carried into the furnace with the fuel.

Reported Efficiencies

The equivalent coal and the boiler plant efficiencies as reported to the News Print Service Bureau by the news mills does not afford a true comparison between the different mills. The reports of some of the mills of efficiencies of over 70 per cent when burning hog fuel are misleading. Apparently such efficiencies are computed without charging boiler plants with the loss due to moisture in the fuel.

Manifestly, there should be developed a method of computation that can be used to compare the costs in each individual mill of generating steam with any of the alternate available competitive fuels.

It is often a question whether it pays to burn in the furnaces the refuse from drum barkers with high moisture content and the dirt contained with the bark. The extra maintenance costs often more than offset the recoverable fuel values.

Storage and Handling

Hog fuel, because of its bulk per available B. t. u., is expensive to handle and when once in motion should be kept so until it lands in the furnace. Because it mats and packs in bins, it should preferably be stored in the open where it can be raked onto conveyors. Many attempts have been made to recover and move hog fuel by blower systems. Most of these have now been abandoned due to excessive power and maintenance costs.

When stored, either in the open or in bins hog fuel loses in heat value. This loss is progressive for from three to four months, after which its value remains fairly constant. It is possible for hog fuel to lose from 25 to 30 per cent of its fuel value.

Combustion

The high oxygen content of wood refuse results in higher CO_2 than with other fuels. Theoretically over 20 per cent CO_2 is required for perfect combustion. The better installations maintain over 17 per cent CO_2 corresponding to from 18 to 20 per cent excess air.

To obtain the best results provision must be made to give the long flame, slow burning gases time in which to complete combustion. This can be accomplished by increasing the length of gas travel, by slowing down the gases through the combustion chamber or by combination of the two.

When hog fuel is produced from logs that have been floated to the mill in salt water, the bark and sap wood absorbs considerable salt. This salt fuses at low temperatures. The salt in the combustion gases presents an operating problem when high ratings are attempted. On entering the boiler, the molten salt lodges in the tube bank, on the baffles and about the superheater solidifies and affords difficulties similar to the "bird nesting" of fly ash. Definite limitations to sustained high ratings have been in several cases due to the building up of these salt deposits. It is the author's belief that this difficulty is aggravated by the presence of compound sulphur salts from the fumes and waste liquors from a sulphite mill.

Furnaces

While probably 95 per cent of all the hog fuel consumed has been burned in dutch oven furnaces fitted with flat grates and with the fuel dropped through openings in the roofs of furnaces onto conical piles, it has long been realized that this arrangement is subject to many criticisms.

Many alternative designs have been tried. In the Pacific Northwest a sloping grate was tried by the author about seven years ago and has attained considerable popularity in the district, especially in the pulp and paper industry. About 35,000 horse power of boilers have been fitted with sloping grate furnaces burning hog fuel in the Pacific Northwest. With these furnaces the grates are placed at such an inclination as to maintain a uniform fuel bed and the fuel enters through a slot running the width of the furnace. Frequently step grates are used to facilitate cleaning and provide greater percentage of air space without excessive riddling. With sloping grates the percentage of cold air entrapped with the entering fuel is materially reduced.

There are capacity limitations to the use of sloping grates. Most of the combustion in the flat grate furnaces can be classified as surface burning. In the inclined grate furnace most of the air is passed through the fuel bed and it does not take much draft to lift the light particles of incandescent carbon and blow holes through the fire. When hand barker shavings are burned, they must be rehogged for sloping grate furnaces or they will provide a loose structure of fuel bed through which blow holes occur. This results in the necessity of excessive labor for tending the fires.

Sloping grate furnaces do not work so well with a high percentage of sawdust as the tendency to mat does not permit sufficient air to pass through the cooler end of the furnace.

The hearth type of furnace, as developed by the Babcock & Wilcox Company for the Cuban sugar cane industry should work well with hog fuel or wood room refuse. Although several propositions to install such furnaces have been considered, there have

been no actual installations made in the pulp and paper industry.

Furnace designs have not been standardized and there is room for much investigation and research in the burning of wood waste. With increase in value of this fuel, this study will naturally follow.

To give an idea of the variation in design and at the same time set forth some of the fundamentals to the securing of satisfactory results, the following statements are made.

Grates

It has been customary to lay out furnaces with from three to four rated horse power per square foot of grate surface, which gives from seven to eight developed horse power per square foot. This is too indefinite. Consideration should be given to the shape of the furnace, the temperature of the air (with preheat less grate surface is required) the available draft in furnace at maximum expected in determination of required grate surface.

There are a few installations in which as high as from 15 to 18 horse power has been developed per square foot of grate. With wood refuse running from 45 to 50 per cent moisture, one should not figure over 5 to 6 horse power per square foot of grate, while with the wet fuel from drum barkers, it is advisable to figure from 3 to 4 as a maximum without preheat.

As grates are expensive to maintain, it is desirable to eliminate unnecessary grate surface and furnaces are being used in which the non-effective portion has been installed as a fire brick floor. This is done with the economy grate, to which later reference will be made. It has been found that water cooled grate bars can be kept clean with less effort than air cooled bars. As the life of air cooled bars with preheated air is limited, water cooled bars are used with preheated air. This makes possible preheating the 70 or 80 per cent of air to higher temperatures. Water cooled grates have been made of cast iron with imbedded water cooling pipes. These are not as effective in preventing slag accumulation as the steel grates made of tubing. It is also impossible to secure the desirable percentage of air space.

The Economy grate develped by Simeral and Drill is constructed of steel tubing deformed into oval sections and welded into headers. By the use of this section high percentage of air space is obtained with small percentage of riddlings, and the slotted nozzle shape of the opening between tubes affords minimum resistance to air flow. By suitable arrangement of headers, grate sections are arranged for series or parallel water flow. In all water cooled grates, ample water flow must be maintained to prevent steaming. The water heated within the grate can be used as make-up or, if the water is of a character that would scale or plug up the grates, it is desirable to provide a heat exchanger by means of which distilled water can be recirculated through the water cooled grates.

Setting Heights

In as much as it is important to secure time in which to complete combustion before the gases enter the tubes, the setting height of boilers has been progressively increased. On the Stirling boiler the modern settings range from 9 to 25 feet from floor line to center line of mud drum. It is sometimes possible and economically desirable to secure the desired time element by slowing down the gas travel rather than making further increase in length of gas travel. The proper design of furnace for a given set of conditions embodies the study of the best combination of setting height with gas weight per square foot of horizontal section through the furnace.

Furnaces are frequently constructed with the flat arch horizontal over the front portion and the rear inclined downward at angles of 30 to 45 degrees forming what is termed a "drop nose," extending beyond the stub bridge wall to force the gases downward after passing over stub bridge wall. This is done to better utilize the combustion space below the level of the throat between stub bridge wall and furnace roof, and thus increase the length of gas travel. This construction also tends to throw down the particles of unburned cinder to the bottom of combustion chamber, making necessary the periodic introduction of secondary air to consume this cinder.

Throat Area

Any bottling up of the gases in the furnace before they enter combustion chamber tends to increase the temperature in the furnace and, in case of high moisture fuels, is desirable. This, in combination with the drop nose construction of furnace roof, shields the furnace from radiant heat absorption by the first bank of tubes, further inducing high furnace temperatures. It is desirable to maintain less than one-tenth of a square foot of throat area per rated boiler horse power, to produce sufficient velocity of gases to secure turbulence and make effective the bottom portion of combustion chamber. However, if this is cut too fine, there will be increased erosion of the drop nose at points of impingement of the gases.

Furnace and Combustion Chamber Volume

In computing furnace volume, due consideration should be given to the volume occupied by the conical piles of fuel, and comparison should be made on the basis of the net or remaining furnace volume. In various installations the net furnace volume ranges from one-half cubic foot to two cubic feet per rated boiler horsepower.

The volume of combustion chamber in various installations ranges from one to three cubic feet per rated horsepower.

Heat Release

In designing furnaces the heat release should be determined for maximum rating. Because of the comparatively low temperatures in combustion space, higher heat releases can be used without undue punishment to brick work than with powdered coal or oil. There are a number of installations in operation with heat releases ranging from 25,000 to 50,000 B. t. u. per cubic foot of net furnace volume plus combustion chamber volume.

Water Cooling of Combustion Chamber

With high setting so that the fraction cold surface represented by the boiler tubes is low, it is desirable to supplement the cooling of gases within the furnace by the introduction of water cooled walls in order to reduce maintenance on brick work.

Refractories

Special attention should be given to the selection of refractories in burning of wood waste. Brick high in alumina, that will be particularly desirable for use with coal or oil, are not necessarily the best to use with wood refuse. The salt contained in the refuse from wood that has been in salt water serves to flux the brick surface. This action is further augmented by the presence of calcium. The shells and the linings of toredo bores are calcined within the furnace forming calcium oxide, and analysis of wood ash from wood refuse from salt water borne logs is high in calcium.

As expressed earlier in this paper, the writer feels that there is a great deal of room for further intensive study of the problems attached to efficient combustion of wood refuse and that those who have been fortunate in having extensive experience with this fuel, can be of material aid to those whose experience has been limited to individual plants.

Laboratory Wet Machine

The Downingtown Manufacturing Company of Downingtown, Pa., a company member of the Technical Association, has recently built a laboratory size wet machine for making sample pulp laps. There has been an evident need by TAPPI members for a machine such as this and the Downingtown Manufacturing Company and Jacob Edge in particular, are to be commended for interest in being of special service to the paper mill engineers.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

For photostatic copies of articles appearing in the Abstract Section, address the chairman of the Abstracts Committee, Dr. Clarence J. West, National Research Council, 21st and B Streets, Washington, D. C. The charge for this service is: Photostats 9 x 11 inches, 18 cents each; 18 x 11 inches, 35 cents each; 22 x 18 inches, 70 cents each; minimum charge, 50 cents. Payment should be made upon receipt of invoice. Copies of United States patents may be obtained from the U. S. Patent Office, Washington, D. C., for 10 cents each. Send currency not stamps.

Machinery

Machine for Making Prepared Roofing. Robert Maclean, assignor to Amalgamated Roofing Co. U. S. pat. 1,774,988, Sept. 2, 1930.—The invention provides for the construction of bins for holding different materials for surfacing roofing. They are arranged to permit of quickly and easily changing from one material to another, and also of using accurately proportioned and thoroughly mixed combinations of different materials.—A.P.-C.

Arrangement for the Piling of Pulp Wood. Otto Thurswieser. Aust. pat. 118,328 (Feb. 15, 1930).—The device is especially recommended for small wood yards which are constantly changing position.—J. F. O.

Arrangement for screw and Spiral Presses and Similar Apparatus. John Strindlund. Nor. pat. 48,135 (Jan. 14, 1929). The screw is so arranged and its drive device so connected that during a part or all of its rotation it receives a shaking or vibrating motion in the axial direction, or a rotatory motion or both at the same time.—J.F.O.

Feed Arrangement for a Rotating Screw Press. Nils J. Liaaen. Nor. pat. 48,193 (Nov. 4, 1929). The position for feeding the material being treated is fixed so that it can be changed to any desired position in relation to the longitudinal direction of the press housing.—J.F.O.

Process and Device for the Manufacture of Objects of fiber with Permeable Walls, and Under the Aid of a Heated Gas which Forms the Required Pressure. Baumgartner Dr. Katz & Co. G.m.b.H. Ger. pat. 496,008 (July 7, 1929). A part of the gas, used as the pressure means, permeates through the walls of the object being formed, while the other part leaves the interior of the object by means of a valve. The fiber and the heated gas used as the pressure means are introduced through a pipe. By the use of steam as the means of pressure, a part of this is removed from the object through the valve as condensate. The heat derived from the pressure means or its condensate is used to heat the mixture of fiber. A mixture of fiber with a Schopper-Riegler beating degree of at least 45 is used.—J.F.O.

A New Stock Pump, Designed by Morck and Froisland. Wochbl. Papierfabr. 61, No. 45; 1434 (Nov. 8, 1930). Since the ordinary centrifugal pump is unsuited for pumping heavy stock, because of the adherent properties of the stock, (the water separating from the stock as soon as the stock is subjected to uneven pressure,) a new pump has been designed. Another difficulty with the ordinary pumps is that the speed of rotation must be low for the stock which means a large pump. The new pump is chiefly a centrifugal pump placed in a horizontal position with the drive motor above the pump. It is claimed that this pump can handle 15 per cent stock and with less power. The pump is suitable for circulation purposes as well as for transportation and over a hundred pumps are now in operation and giving satisfactory results.—J.F.O.

Self Acting Arrangement for Regulating the Overflow of a Revolving Screen, Especially for Ground Wood, Chemical Pulp, etc. Jens Larsen. Ged. pat. 496,865 (Dec. 7, 1927).—J.F.O.

Process for the Heating of Evaporators by Means of Heat Pumps. Aktiengesellschaft Brown Boveri & Cie. Ger. pat. 498,746 (July 17, 1928). By means of the air compressors on hand, air is introduced through the heating system to enrich the process temperature.—J.F.O.

Evaporator. Societe des Condenseurs Delas. Ger. pat. 499,315. (March 16, 1924). An automatic liquid regulator, acting by expansion, is influenced by the top cascade stage and holds the volume of liquor in the evaporator at its economic capacity, as well as maintaining the level of liquid in the various stages at their required level.—J.F.O.

Evaporator. Paul H. Muller. Ger. pat. 494,105 (March 14, 1926). The process consists in an evaporator, especially for liquids in which steam from the heated liquor forms a lower tension in a high space and in which the inlet line for the liquid to be evaporated appears so far under the surface of the liquid that the tension at the entrance of the pipe is equal or larger than the tension of the steam of the liquid. The invention is characterized in that the liquid being evaporated is led into a steam air mixture.—J.F.O.

Process for the Utilization of the Steam from the Continuous Operating Evaporators in a Pulp Mill. E. Morterud. Swed. pat. 69,968 (July 13, 1928). The heat of condensation contained in the steam evaporater is fed into a quantity of liquid which is used in the usual manner for the preheating of the wood in the digester.—J.F.O.

Process for the Evaporation of Liquids, Especially Salt Solutions. Metallgesellschaft A. G. Ger. pat. 507,065 (March 24, 1926).—The invention concerns a process for the evaporation of liquids, especially salt solutions, with the separation of solids, such as gypsum, in a heated container in which a higher temperature is maintained than in the evaporators, the liquid being led from the evaporators into the separation container.—J.F.O.

Process for the Heating of Liquids. Willi Schwarzenauer. Ger. pat. 507,066, (June 30, 1922). The purpose of the invention is for a good heat transfer of the steam or gas to the liquid itself by small temperature drops. The liquid being heated and the heating medium is brought into immediate contact with a hydraulic compressor or pump.—J.F.O.

Multiple Evaporator with an Intermediate Heating of the Vapors. Albert Winands. Ger. pat. 507,067 (July 24, 1928). The vapors as well as the substance going to the evaporators is put into a pre-heater.—J.F.O.

Cutter for Paper, Board and Similar Substances. Johne-Werk Graphische Maschinen A. G. Aust. pat. 117,308 (Dec. 15, 1929). The waste from the cutter, in order to guide same through a displacable saddle, is led forward and backward over the table where it is united with other material of less strength. —J.F.O.

Arrangement for Slitters and Cutters of a Paper Machine, for Lay Boys and Similar Apparatus, for Conveying Compressed Air Against Both Sides of the Sheet. Gerald Strecker and

Theodor Gockel. Aust. pat. 118,089 (Feb. 15, 1930). The compressed air outlet nozzles or slits in both pipes conveying the compressed air, are placed crossways to the direction of motion of the paper, and so that one pipe is directed against the other. In this manner a certain stiffness is given to the sheet of paper and it is thus blown through the compressed air stream in the direction of travel.—J.F.O.

A Cutter equipped with a Lay Boy for Paper or Other Fiberous Materials, Pulp for artificial Silk, etc. G. Strecker and Theodor Gockel. Aust. pat. 119,319 (Nov. 15, 1928). The sheet is led through a feed press to the cutter and the sheets from this are carried on an endless belt to the lay boy. The speed of the felt is slightly less than the speed of the feed press and the lay boy.—J.F.O.

Paper Slitter. G. C. Marks from Cameron Machine Co., Brit. 334,905, March 11, 1929.—In a score-cut slitter, a backing roll carries narrow adjustable glass-hard liners which co-operate with the slitting knives. The liners are adjustable axially and are secured in position by forks which straddle the liners and are secured on a rod. In a modification the backing roll carries slitters which are adjustable by forks and which co-operate with backing elements. In a further modification the liners are secured to rotate with the backing roll by spring pins.—A.P.-C.

Cutter with a Slitter Shaft, Moving Intermittently, for Moving Webs of Corrugated Board, Carton, etc. Gunther Clemens. Ger. pat. 505,840 (Aug. 2, 1928).—The cutter is characterized by a slitter arrangement which is controlled by an electro magnetic coupling and brake device. There are ten other claims given for the special carrying out of the arrangement.—J.F.O.

Device for a Cutter for the Placing of Marking Bands. Gerald Strecker and Theodor Gochel. Ger. pat. 497,533 (Jan. 1, 1929).—The marking bands are led over the paper between the feed roll and the cutter.—J.F.O.

Cutter with Lay Boy for Paper or other Fiberous Materials, Pulp for Artificial Silk, etc. Gerald Strecker and Theodor Gockel. Ger. pat. 503,711 (March 4, 1926).—The invention concerns itself with a cutter provided with a lay boy, for paper or other fiberous materials, pulp for artificial silk and similar substances, by which the sheet is led to the cutter through a feed press and the sheets resulting are carried away by means of a felt or belt. The speed of the feed presses, belt, etc. can be regulated separately, although it is desired that the speed of the belt should be less than the feed press.—J.F.O.

Lay Boy for Cutters. Maschinenfabrik zum Bruderhaus, Reutlingen, Germany. Ger. pat. 503,901. (Dec. 28, 1924).—The invention concerns a lay boy for a cutter, by which two sheets of different length and width can be cut and placed in piles having the same height. The tables for the sheets cut is fixed so that it can be raised and lowered.—J.F.O.

Winder Device for Paper Rolls for a Corrugated Paper Machine, with Movable Winder Shafts. Gunther Clemens. Ger. pat. 500,264 (Aug. 2, 1928).—The two rolls are arranged so that they can be revolved around a mean perpendicular axis and also fixed so that a brake can function. The claim of the invention is that the paper can be rolled with a uniform tension across its entire width.—J.F.O.

Device for Winding Paper, Ground Wood or Similar Fiberous Sheets without Cores. Carl Nebrick. Ger. pat. 495,917 (Sept. 13, 1929. Addition to pat. 469,675.—In improving further the process according to Ger. pat. 469,675, the pressure roll for throwing off the finished roll is formed like a cam. A roller acts upon this cam when the desired diameter is reached.—J.F.O.

Unwinding Device for Rolls of Paper used for the Manufacture of Corrugated Board, on a Machine with a Winder Shaft which can be Regulated. Gunther Clemens. Ger. pat. 500,264 (Aug. 2, 1928.—The rolls are arranged so that they can swing and in such a position that their axis is perpendicular. The bearings of the unwinding roll are fastened to a frame capable of being rotated around two axis, which is again arranged on a mutual revolving frame. The frame is guarded against turning during the unwinding of the front roll of paper.—J.F.O.

The New Goebel High Speed Winder. Wochbl Papierfabr. 61, No. 46; 1469, (Nov. 23, 1931).—A description of the construction and operation together with its excellent results and capacity is given.—J.F.O.

Automatic Arrangement for Winders of Corrugated Paper. Gunter Clemens, German pat. 493,430 (Aug. 2, 1928).—The device possesses two winder reels and operates by alternately feeding the corrugated board to the winders. The invention is characterized in that the corrugated board is alternately led through a feeding device, from one guide to the other, which leads the corrugated board to the winder.—J.F.O.

Raw Materials

A contribution to the subject of the utilization of the waste wood. W. Schmid. Papier-Fabr. 29, No. 6: 84-86 (Feb. 8, 1931). The author describes a new method for the utilization of the waste wood, especially for insulating and building boards. It consists mainly of grinding the wood chips and other waste between horizontal stones or raffineures in successive stages. The wood is stored in bins above the raffineures and by means of mechanical contrivances it is gradually fed to the stones in a wet condition.—J.F.O.

Costs of the various fiberous raw materials for the manufacture of paper in Brazil. Fred W. Freise, Wochbl. Papierfabr, 62, No. 8:176 (Feb.. 21, 1931). The author discusses the various difficulties in cutting and gathering the raw materials for the manufacturers of paper; for example there are over fifty different kinds of trees growing together mixed with numerous plants all which makes the transportation and cutting an expensive operation. Several facts and figures are given concerning the cost and yield of the various suitable woods.—J.F.O.

Utilization of Hardwoods for Mechanical and Chemical Pulp. H. S. Hill. J. Forestry 28: 1146-1152 (1930).—As spruce becomes more expensive, hardwoods become more important as pulp raw material. That the pulping qualities of hardwoods have already been investigated and found to be satisfactory for a variety of pulp products is evident from the literature reviewed in the article. The future use of hardwoods for pulp is essentially a matter of economics.—A.P.-C.

Use of Micro-Organisms in Certain Commercial Processes. E. E. Hubert. J. Forestry 28: 542-545 (1930).—A resumé is given of making commercial products with the aid of molds, bacteria, yeasts, etc., with bibliography. Experiments have shown that spruce and balsam fir attacked by the group of fungi causing white rot may produce relatively large yields of pulp by the sulphite process. This finding has possibilities in the future development of pulp manufacture. The author is carrying our experiments on the action of a blue stain fungus on western yellow pine, the resulting by-product of which has commercial possibilities.—A.P.-C.

The Penetration of Water Vapor Into Wood. L. M. Pidgeon and O. Maass. McGill University, Montreal. Research Notes 3: 47-50 (1930); Pulp Paper Mag. Can. 31: 530-533 (April 23, 1931.—The rate of diffusion of water vapor through wood was studied through a comparison of the time taken for samples of various thicknesses to become saturated. This process is in a sense the converse of natural drying, and for comparative purposes is more amenable to careful control of pressure and temperature. Continuous measurements of the amount of adsorption were carried out by the use of a quartz spring balance completely enclosed in the apparatus at a constant vapor pressure. Comparative numerical values were obtained of the rate of diffusion of water vapor through spruce (*Picea canadensis*) and pine (*Pinus banxiana*) in various directions, through heartwood and sapwood, and through samples of different lengths. The results are considered as evidence that the movement of water through wood at concentrations below

the saturation point takes place as vapor diffusion through the spaces of the wood structure due to the pressure gradient consequent on the difference of moisture content.—A.P.-C.

Wood Evaluation for Soda Pulp Manufacture. H. W. Morgan. Paper Trade J. 92, No. 15: 51-52 (April 9, 1931).—The importance of careful control of the quality of soda pulpwood and the present methods of grading are briefly discussed. The technic of the 1% alkali solubility test has been modified to give more uniform heating (resulting in slightly higher temperature), which gives more reproducible though somewhat higher results. From the results of evaluation of aspen wood by physical and chemical methods, the relation of the yield to the 1% alkali solubility was expressed graphically; it is estimated that an increase of 1% in alkali soluble materials is accompanied by a decrease of 3% by weight in the pulp yield. The effects of decay on the composition of wood are discussed and the relation of these effects to the pulp yield are pointed out.—A.P.-C.

Wood Fibers. G. J. Ritter. J. Forestry 28: 533-541 (1930).—The results of an investigation of the microstructure of the fibers of 16 species of wood are presented. Two types of lignin are distinguished. Fiber cell walls are made up of layers, capable of being separated into fibrils by chemical and mechanical means. Fibrils in turn can be chemically separated into fusiform bodies. Cellulose and lignin from wood can be distinguished by their optical properties in polarized light.—A.P.-C.

Utilization of Kaoliang Stalk. III. Industrial Experiments on the Manufacture of Soda Pulp and Paper. Ryuji Yamomoto. Abstracts from Report Central Lab. S. Manchuria Railway Co. 1929: 26-27.—70% kaoliang pulp is used to make white or manilla paper.—A.P.-C.

Bamboo. I. Fine Structure of the Bamboo Fiber. K. Sisido. Cellulose Ind. (Tokyo) 6: 148-150 (1930).—A theoretical discussion of the results of previous workers.—A.P.-C.

Method of Separating the Pith and Fiber of Cornstalks. Elton R. Darling assignor to Cornstalk Products Co., Inc. U. S. pat. 1,790,001 (Jan. 27, 1931).—The fiber of mature cornstalks is separated from the pith by a process comprising the following steps: beating and cleansing the cornstalks; dividing the cornstalks into predetermined lengths; conveying the cut cornstalks under sprays of water to a container; separating the pith in the stock from the fiber; and conveying the fiber to a separate container.—A.P.-C.

Cellulose from Cottonseed Hulls. Bela Dorner. U. S. pat. 1,789,354 (Jan. 20, 1931).—For recovery of filamentous material from them, cottonseed hulls are sufficiently dried to render them brittle, then subjected to moist air for a time only sufficient to allow the filamentous material to absorb moisture without restoring any substantial moisture content to the hulls themselves, the brittle hulls are chopped up or ground into particles without disrupting the filamentous material, and the latter is separated and recovered, and may be used for paper manufacture.—A.P.-C.

Production of High-Grade Pulp. Hans Kammerl. Fr. pat. 693,005 (March 29, 1930).—A valuable cellulose is obtained from soiled plant fibers, particularly cotton waste such as linters, by treating the fibers mechanically to remove the greater part of the impurities in a centrifuge without a screen, after which the pectins, waxes and greases buried in the structure of the fiber are removed by leaching or light boiling.—A.P.-C.

Recovery of Pulp from Printed Paper, and Chiefly Wood Pulp. Louis Grenaudier. U. S. pat. 1,791,445, (Feb. 3, 1931.)—Materials such as old newspapers are soaked in water and then treated with an alkaline bath such as soda ash to form an alkaline soap with the fatty matter of the ink, and a substance such as sodium chloride is used which renders the soap insoluble so that the ink-containing soap rises to the top of the bath and does not mix with the pulp in the bottom of the bath.—A.P.-C.

Unbleached Paper, Cardboard, Etc. Valdemar W. D'Obry. U. S. pat. 1,791,092 (Feb. 3, 1931).—A grass is moistened and steamed under pressure while preventing escape of substantially all the constituents of the grass, and the material is then mechanically disintegrated for making paper, cardboard, or the like.—A.P.-C.

Cellulose and Lignin

Sugar Cane Alpha-Cellulose. Joaquin de la Roza. 4th Ann. Conference Assocn. Sugar Tech. of Cuba, 1930; Sugar Abstracts, Facts About Sugar 26:88; C. A. 25:3161.—The cellulose plant installed at Central Tuinucu, Cuba, for producing basic raw material for a number of valuable products is considered and the requirements of commercial alpha-cellulose as to ash, color, etc., are discussed. The difficulties encountered in developed the equipment and the process—digesting, pumping, foaming, draining, screening, corrosion, bleaching—are enumerated. It was found indispensable to keep fine bagacillo away and often a change in the direction of the wind would render necessary extreme measures. Cuban alpha-cellulose is considered a proved competitor of purified cotton linters and represents a great help to the sugar industry.—C.J.W.

Determination of Alpha-Cellulose. H. Pincass. Kunstseide 12:282-283 (1930); C. A. 25:1667.—Cellulose materials analyzed for alpha-cellulose by 3 different methods gave different values. The differences in the results are due mainly to differences in the preliminary drying of the sample and to differences in the methods of washing out the alkali and drying the alpha-cellulose.—C.J.W.

Estimation of Wood Pulp in Paper. E. Debenedetti. Boll. Staz. Sper. Carta E Fibre Tessili Vegetali 9:134-137 (1930); C. A. 25:2562.—The chemical methods for detecting and determining wood pulp in paper utilize reactions for cellulose and lignin. The lignin content varies with different wood pulps but average values have been determined for the woods and cellulose used in papermaking and from these values can be calculated approximately the wood or mechanical pulp contents in a paper when jute and manilla are absent. Reagents used as (*a*) One gram phloroglucinol, 500 cc. alcohol, 25 cc. concentrated hydrochloric acid; (*b*) 5 grams aniline sulphate, 100 cc. distilled water, 1 drop sulphuric acid; (*c*) dimethyl-*p*-phenylenediamine. Their use is limited to white or light-colored papers. The quantity of lignin is determined (1) directly by liberating from the cellulose and weighing, (2) by measuring the consumption of certain chemicals absorbed by the lignin substances, (3) by dissolving the lignin with suitable agents, weighing the residual cellulose and calculating the lignin by difference. Many methods use the hydrolysis of cellulose with strong acids that under proper conditions do not attack the lignin, which can be dried and weighed. Sulphuric acid, hydrochloric acid and nitric acid alone, or together or with dehydrating agents, have been proposed. Chlorine, bromine, phloroglúcinol and potassium permanganate also are used for determining lignin.—C. J. W.

Studies on Lignin and Related Compounds. VII. A Kinetic Study of the Action of Hypochlorous Acid on Spruce Lignin and Its Bearing on the Constitution of the Spruce Lignin Molecule. Harold Hibbert and K. Austin Taylor. Can. J. Research 4: 240-253 (March, 1931).—The action of hypochlorous acid on glycol-lignin in finely divided aqueous suspension, and in alkaline solution, is autocatalytic, the autocatalysis being due to formation of hydrochloric acid, which catalyzes the reaction strongly. Nitric acid apparently acts only by increasing the concentration of undissociated hydrochloric acid. The effect of the hydrochloric acid may be a direct catalytic effect of undissociated hydrochloric acid, or may be due to formation of chlorine. A comparison of the amounts of hypochlorous acid absorbed, and hydrochloric acid formed, by methylated and unmethylated lignin, indicates that if ketomethylene groups are present in lignin they do not enolize sufficiently to play an appreciable part in the rapid reaction between hypochlorous acid and lignin. The rapid absorption of hypochlorous acid by lignin, dissolved in alkali, indicates that there is probably about 15% of a phenol nucleus in lignin. This value is supported by the rapid absorption of bromine from bromine water at very low concentra-

tions by lignin dissolved in alkali, and is based on the assumption of only 1 atom of halogen entering the phenol nucleus, which is true in the case of vanillin. If 2 or 3 halogen atoms enter the nucleus, this value of 15% has to be divided by 2 or 3. It represents in any case a maximum value. The phenol nucleus accounts for only one-third, or less, of the total rapid hypochlorous acid absorption. The remainder is probably due to addition of hypochlorous acid to an ethylene linkage, chlorination of a phenol ether, or a combination of both reaction.—A.P.-C.

Isolation and Identification of a Polysaccharide from Southern Yellow Pine. E. Leon Foreman and D. T. Englis. Ind. Eng. Chem. 23: 415-416 (April, 1931).—Arabinogalactan was isolated and identified in the "cyclone condensate" produced in the treatment of *Pinus palustris* by the Masonite explosion process, and was also extracted directly and identified from the wood.—A.P.-C.

Contributions to the Chemistry of the Plant Cell Wall. V. Microscopy of Acid-Treated Sawdust as an Index to Some of the Differences in the Physical Properties of Hardwood and Softwood Lignin. W. M. Harlow. Ind. Eng. Chem. 23: 419-420 (April, 1931).—Experimental evidence is given showing that it is highly improbable that the difference noted between the behavior of hardwood and softwood lignin in the determination of lignin by the 72% sulphuric acid method can be explained on the assumption of incomplete removal of cellulose. The differences in physical properties may be readily explained as follows: (1) During refluxing the particles of hardwood sawdust, already deprived of their original topography through acid action, are further broken apart and consist of small, irregular strings of aggregates of the middle lamella, which settle very slowly; the particles of softwood lignin retain the general appearance of the original sawdust and, on account of their size, tend to settle more rapidly. (2) Speed of filtration is affected by the size and character of the particles which in the case of hardwoods quickly plug the pores of the alundum crucible. (3) In drying, the hardwood lignin, already closely packed, forms a dense, hard cake at the bottom of the crucible.—A.P.-C.

Contribution to the Knowledge of Lignin. R. O. Herzog and Armin Hillmer. Papier-Fabr. 29, No. 23A: 40-46 (June, 1931).—The absorption of ultra violet rays has produced a method which will help considerably in determining the constitution of lignin which up to the present has been considered by various investigators to be anything from aromatic, hydroaromatic, to pure aliphatic. The absorption spectrum has proved without a doubt that lignin is of an aromatic nature. The authors describe the method of ultra violet absorption spectrography and its use with lignin. The two theories concerning the formation of lignin are studied, the first theory being that the lignin is formed from pentose and pentosanes which are converted into pectin as an intermediate product, the second theory being that the lignin is formed from a phenolic substance which through condensation and polymerisation or similar changes forms into lignin.—J.F.O.

Mechanical Process

Continuous Grinders and Pocket Grinders. Walter Brecht and Erich Schaun. Wochbl Papierfabr. 62, No. 10: 223-231 (March 7, 1931).—While comparisons can be made of the cost, labor required, production, etc. of the continuous grinder and the pocket grinder, it is impractical to compare the qualities of the fiber from each type of grinder. It seems that the quality of fiber required for the new high speed newsprint machines is successfully made from a continuous grinder. The constant change in the pressure on the pocket grinders is eliminated with the continuous grinder and hence a more uniform fiber is obtained from the continuous grinder. The authors supplement the article with numerous curves showing the production at various pressures and with other variables.—J.F.O.

Process and Device for the Moistening of Pulp Stones During Its Operation. Fritz Ruhleman. Ger. pat. 511,547 (June 30, 1929).—The pulp stone is moistened through its interior whereby the temperature of the stone is kept at the same temperature as the shower water. For carrying out this idea, a hole is bored into the shaft through which the water is introduced and by means of side borings it is conducted to the interior of the stone.—J.F.O.

Wood Grinder. Wilhelm Thaler, assignor to American Voith Contact Co. U. S. pat. 7,786,679 (Dec. 30, 1930).—The wood-feeding chain is guided, immediately above and immediately below the lower sprocket wheel, in a guide, so that the chain in this guided part acts in effect as a rack. In this way the chain can extend considerably below the center line of the sprocket and close to the grindstone, and it translates its effective operation to the logs in close proximity to the stone. The links of the chain are then given an outward angular movement so that the effective disengagement of the spikes or wedges of the links of the chain out of the logs takes place rapidly and efficiently.—A.P.-C.

Drive for Wood Pulp Grinders. Wilbur L. Merrill assignor to General Electric Co. U. S. pat. 1,785,490 (Dec. 16, 1930).—The invention aims at providing a regulating device, more particularly applicable to continuous grinders driven in pairs by a single electric motor, for equalizing the loads on the stones, for maintaining the most economical load on each stone even when the stones are not of the same diameter, and for taking care of conditions arising due to possible "arching" of the wood in one of the magazines. Each grinder has a separate feed motor which are both supplied with current by a generator driven by the main grinder-motor; this generator is provided with an automatic regulator so that the voltage of the generator is varied in accordance with the load on the grinder motor, thereby varying the power supply to the feed motors inversely to the load on the grinder motor. In order to insure that the feed motors (which are preferably of the series type) will properly distribute the load between them, the armatures of these motors are connected in series. Arching of the wood in one of the magazines would result in excessive loading of the other grinder if the total load on the grinder motor is kept constant; to prevent accidents, provision is made to quickly reduce the load to be automatically maintained on the main grinder motor. In order to take care of differences in the diameters of two stones adjustable rheostats are provided to shut the feed motors, and by varying the value of the resistances in the rheostats a very fine adjustment of the loads imposed by the feeding mechanisms on their respective stones may be obtained.—A.P.-C.

Process and Apparatus for Disintegrating Wood. George H. Ellis assignor to The Insulite Co., U. S. pat. 1,785,544 (Dec. 16, 1930).—Air-dried wood chips are first passed between a pair of submerged rolls and compressed to remove the air from the wood; they are then discharged into a confined water chamber and allowed to expand and absorb water, which the compressing and expanding operations are repeated until the fibers become separated. Hot water is preferably used. An acid or alkaline solution may be used instead of water. Barking the wood is unnecessary as the bark is eliminated in the final washing operation.—A.P.-C.

Alkaline Processes

New Methods for the Improvement of the Quality of Pulps. W. Schmid. Papier-Fabr. 29, No. 23A: 48-52 (June, 1931).—A description of events leading up to the forced circulation of cooking liquor according to Morterud, which resulted in greater yields, better quality, etc. and the process for the drying of pulp by warm air instead of the usual cylinders, both inventions leading up to a great increase in economy.—J.F.-O.

Process for the Manufacture of Cellulose. E. Hagglund. Fin. pat. 13,034 (June 14, 1928).—After an alkaline cooking to the degree just before final decomposition, the material is subjected to a treatment with chlorine gas for a short while and finally subjected to a solution of hypochlorite.—J.F.O.

Soda Process Studies. III. Action of Alkali Solutions on Sulphite Pulp. J. H. Ross and C. R. Mitchell. Research Notes 3: 21-23 (1930); Pulp Paper Mag. Can. 31: 402-403, 414 (March 19, 1931).—When bleached sulphite is treated in a rotary digester

for 3 hours with caustic soda solutions at temperatures of 150° to 180° C., the concentration of alkali (over the range 1 to 70%) at temperatures below 160° C. has but little effect on the quantity of material dissolved and on the alpha- and beta-cellulose contents of the residue; at higher temperature the effect of concentration is much more marked. For every temperature there is an optimum concentration of alkali which produces a residue of maximum alkali resistance. The fluidity of solutions of the treated pulp increases regularly as the temperature of digestion and alkali concentration are intensified. For each temperature of digestion there is a concentration of alkali which produces a maximum of bulking properties in the fiber.—A.P.-C.

Alpha-Cellulose. Lauri I. L. Durchman. Can. pat. 397,799 (Jan. 20, 1931).—Alpha-cellulose is produced by cooking wood chips with black and white sulphate liquor with the addition of sodium sulphite in the proportion of 0.8 to 1.0% based on the air-dry weight of the wood chips, boiling the resultant pulp under atmospheric pressure with a mixture containing caustic soda and sodium chloride, bleaching, treating the bleached pulp at room temperature for 3 to 6 hours with a 5 to 12% solution of caustic soda, recovering the caustic soda, washing and treating with oxalic acid to neutralize the residual alkali and to facilitate the extraction of other residual and coloring impurities.—A.P.-C.

Process for the Production of Fiber from Wood. George A. Richter and Milton O. Schur assignors to Brown Co. U. S. pat. 1,790,838 (Feb. 3, 1931).—Chipped wood such as jack pine is digested under pressure and with heating in a saponaceous alkaline liquor such as caustic soda solution containing 0.3 to 0.4 per cent of soap.—A.P.-C.

High Grade Alpha-Cellulose. Lauri I. L. Durchman. Can. pat. 307,798 (Jan. 20, 1931).—Incrusting substances of wood pulp are converted into water-soluble compounds by treating the pulp for 4 to 6 hours at 20 to 60 lbs. pressure with a solution containing 2 to 5 per cent caustic soda and 1 to 3 per cent sodium sulphite, bleaching, treating the bleached pulp at room temperature for 3 to 5 hours with white liquor to effect removal of incrusting substances for obtaining a high grade alpha-cellulose, treating the pulp with oxalic acid to precipitate the calcium compounds and to dissolve the iron compounds, and washing the pulp to remove the iron and calcium compounds.—A.P.-C.

Fibrous Raw Materials Committee Report

The field of activity implied in the name of this committee is so broad that a voluntary committee has to confine itself to the phase which interests its members most.

During the past few years the subject of paper permanence has been brought into prominence and users and buyers of papers of all kinds are becoming increasingly interested in a better understanding of the relative permanence of the papers offered. The practical interest centers about a means of determining the relative permanence of the various papers offered for a special grade or kind of paper. This applies most especially to the high grade papers offered for permanent documents but is also of interest to papers of all grades in a relative manner.

The special committee of the English Library Association, in their report for 1930 state that—"No one will deny that it is absolutely essential in the interest of scholarship that any publication embodying original data and evidence, the outcome of research and possible material for future discovery, should be printed on paper which will guarantee its survival for the use of future generations. That the authorities issuing such publications should use durable paper is, therefore, in the view of the committee, an obvious first step towards general improvement."

Much isolated work has been done on this subject in the past, especially by the government testing laboratories in Germany and Sweden and usually with reference to oven heat or sunlight aging. Much of the work was based on color changes from such tests and general observations of commercial papers. The modern development of physical and chemical methods of testing papers for specific uses have made it possible to carry the work of permanence much further than has been done in the past.

The usual verdict is that mechanical problems are solved in the mill and chemical problems in the laboratory, but the matter of paper permanence so intimately combines both of these factors being dependent on fiber qualities and on paper formation that the only satisfactory solution will involve the united verdicts of science and industry. For that reason the Technical Association, where science and industry meet to discuss common interests, is the logical place to bring together all interested in the subject and develop the solution which meets the greatest number of the conditions involved.

Scope of the Work

The work of development of an understanding of paper permanence includes:

A clear analysis of the meaning in terms of paper durability and permanence of each of the physical and chemical tests used on paper.

A stardard normal aging condition to which all accelerated aging tests may be referred.

A careful selection of those accelerated aging tests which can be generally used to indicate the resistance of a paper to every factor which enters into the normal aging of paper.

And this is the goal towards which this committee has been working.

Program

At the meeting of last year, definitions of the terms durability and permanence were given by H. U. Kiely and were afterwards accepted by the permanence and durability committee. This eliminates confusion from the loose use of these words commonly heard. This was followed by a paper by M. D. Bardeen giving a critical summary of the literature on permanence after which E. Sutermeister led a discussion on fiber differences and their relation to papermaking processes. E. O. Reed then opened a discussion on the value of artificial aging in which oven aging, ultraviolet light aging and atmospheric conditions were discussed. The discussion which followed the next paper by B. L. Wehmhoff on the subject of pH testing of papers was continued until the meeting was obliged to adjourn.

The program for this year will begin where it left off last year and is outlined as follows:

The relation of acidity tests to the probable permanence of paper.

The copper number determination and its relation to paper permanence.

The viscosity of cuprammonium solution as a measure of fiber quality.

The alpha content as a measure of fiber quality.

The soda soluble test as a measure of halfstock or pulp quality

The value of artificial aging in predicting paper permanence.

Permanence from the standpoint of a paper user, by H. M. Lydenberg, Assistant Director of the Library of New York City.

Literature Developments

The early literature on papermaking fibers accepted the theory that fibers from different sources were fundamentally different in properties. Then gradually the scientific literature developed evidence that the fundamental unit cellulose material out of which all fibers are built gives similar reactions and is most probably identical in all types of fibers including grasses, straws, wood, cotton and linen. This knowledge lent considerable encouragement to wood pulp manufacturers to increase their efforts to isolate cellulose material from the wood in a purer form and results have

* Presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, New York, N. Y., Feb. 17-19, 1931.

shown that the more the extraneous matter is removed from the wood fiber, the nearer the fiber approaches some of the properties of cotton which occurs in nature as almost pure cellulose.

During the past few years there have appeared several contributions from scientific laboratories which, while accepting the identity of the cellulose unit in the fiber, develop information which make it questionable as to whether fibers built from the same unit material are necessarily identical and whether we can expect identical qualities in papers made from the different types of fibers. Among these contributions we might mention the following:

A. J. Hall in "Cellulose" for August, 1930, states that the cotton fibers "must be considered to consist of a cylinder of reactive cellulose protected from external influences by a sheath of highly resistant cellulose" thus indicating the presence of two different structures from the same unit material.

G. J. Ritter of Madison, Wisconsin, in the Paper Trade Journal. Vol. 87, p. 181-7 (1928) states—"The cell wall of wood fibrils is composed of several layers which can be separated into fibrils by chemical means. The fibrils in the outer layer are oriented at approximately right angles to the fiber axis while those in the remaining layers are from 0 to 30 degrees thereto." In the cotton fiber the fibrils extend the length of the fiber and under mechanical beating separate into tangled masses, thus again indicating differences in fiber structures.

Professor Maas of McGill University in the Journal of the American Chemical Society, Vol. 52, p. 1053-68 (1930) in a study of the relation of atmospheric humidity to water absorbed, states that the curve for the swelling of all wood fibers whether heart or sap wood, green or dry, pine or spruce is similar but "The adsorption values for pure cotton are considerably lower than for wood . . . and this difference is probably due to a difference in character between the cotton and wood cellulose. . . . The fact that the adsorption curves do not coincide in any part indicates a difference in chemical attraction rather than a physical difference in structure." He suggests that this difference might be associated with the waxes in the cotton or the beta and gamma celluloses in wood but develops no evidence therefor.

Professor G. L. Clark of Illinois University in speaking before the American Chemical Society in Atlanta last spring states that "The principal ring for alpha cellulose is double which means that in its preparation cellulose hydrate or mercerized cellulose has been formed and that the material is a mixture of changed and unchanged cellulose."

Dr. Stamm reports in the Journal of the American Chemical Society of work done in Sweden in which he states that "The present data indicate that the difference between isolated wood cellulose and cotton cellulose is largely a difference in the degree of association of the structural building units and perhaps also in the manner in which the fundamental building units are put together. The isolated wood cellulose shows the presence of a material of the same molecular dispersion as that of cotton cellulose together with a material of one-half this molecular weight, and molecular species of still finer dispersion."

From this evidence we seem to be working towards an understanding of fiber structure which will undoubtedly, in many ways, influence paper research of the future.

Permanence Standards for the Paper Industry

In England in 1929 the Library Association set up a special committee for investigation and requested the Government and the Papermakers Association to develop and establish official standards for durability and permanence. At that time they suggested three provisional grades which sold at a relative price basis of all-rag, 28; half rag and half chemical wood, 23 and all-wood, 18.

In the report of this special committee in 1930 a definite set of paper specifications is proposed on a relative price basis as follows:

Grade I. a, Linen or cotton stock of best quality, hand made, tub sized, pH in situ 5.5 to 6.0, no iron and no filler.

Grade I. b, as in grade I, a, but machine made and tub or engine sized or both.

Grade II; Properly prepared, all-chemical-wood, machine made, engine sized, ash less than 5 per cent, rosin less than 1.5 or at most 2.0 per cent, iron no more than a trace.

Grade III. Papers from esparto and straw.

Grade IV. Papers from mechanical wood-pulp.

Relative price basis for I, a is 6, for I, b is 3 and for II is 1.

Among the comments included in the report of the committee are the following:

"The requirements for absolute permanence can only be judged on the basis of an examination of papers which have actually survived; all old Western papers are made from pure cotton and linen rag, animal sized. But the committee had also to consider the provision for relative permanence—such as would permit to a reasonably distant posterity the opportunity of forming its own judgment on the written and printed productions of the present day.

"In presenting their opinions upon materials which have come into use only within the last 60 or 70 years, the committee..... cannot exclude the possibility of materials now regarded as inferior being elevated by improvement in the method of manufacture to a higher grade.

"There was agreement that for absolute permanence there was no evidence in favor of materials outside those set out in class A.

"They are convinced that one of the greatest evils in contemporary book production is the use of featherweight paper. Their texture is loose and the leaves are therefore liable to fluff and clog the press during printing; they are easily frayed during handling.

"Esparto gives a paper pliability, gloss and flatness. The coating of paper with mineral matter renders it brittle and liable to deterioration; and this irrespective of the composition of the base paper. (This finding is surprising in view of findings in this country.)

"Two papers of exactly the same constituents may have different values from physical testing though made from the same basic conditions with regard to purity of the fundamental materials involved.

"Many books justify a furnish as represented by class B. This furnish has not been in use long enough to give evidence of absolute durability; yet a high degree of permanence may be inferred for papers carefully made from it."

Since publishing this report there have been numerous public comments. Perhaps the greatest dissatisfaction among English papermakers has been the placing of chemical wood pulp in a higher class than esparto even though admitting that they have no practical data to support this classification.

JESSE E. MINOR, Chairman

Materials of Construction Committee

The following is a tentative outline of the activities of the Materials of Construction Committee, taking into consideration those materials pertaining to the Industry.

1. Plant Construction Materials.
   a. Materials for unusual service.
   b. Protective Coatings.
2. Process Materials of Construction.
   a. Metallic.
      (1) Corrosion problems.
   b. Non-metallic.
      (1) Ceramic—Tile and power plant refractories.
      (2) Wood—Treated and untreated wood for tank construction.
      (3) Cement, concrete and special linings.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by **Reginald Trautschold Consulting Engineer**

Water In Steam Generation*

Treatment and Concentration Control

As necessary as it is to have a satisfactory water supply, adequate and reasonably pure, for use in paper making, whether high quality or low grades of paper are produced, white or colored, it is even more essential that the water supply for the boilers, for use in steam generation, be satisfactory. The available water, of course, is never quite pure, but always carries some impurities, and the process of evaporation, of steam generation, serves to make matters progressively worse, by a concentration in uncontrolled boiler water of these and other impurities. High steam temperature and pressure and accelerated rates of steam generation, one and all, aggravate the situation, so that the proper conditioning of the boiler water has become the outstanding requirement for the safe and economical operation of the steam plant, particularly where modern, high pressure steam generators are employed.

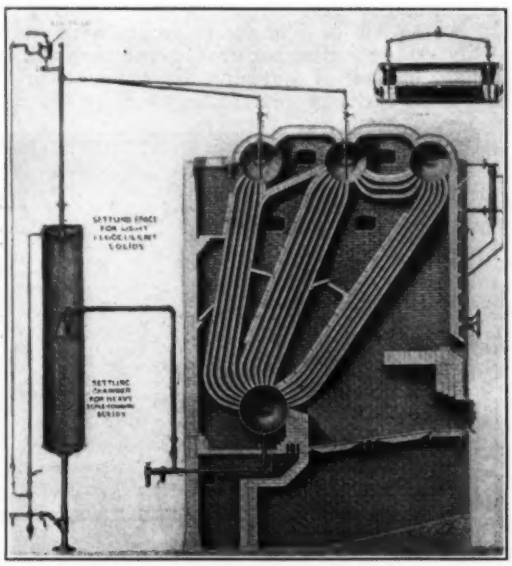
The treatment of the feed or boiler water by the use of chemicals and boiler compounds in an indiscriminate manner should no longer be countenanced in any steam plant. It is altogether too costly and invites endless expense and danger from scale, corrosion, foaming, priming, wet steam and others of the many troubles peculiar to the generation of steam in the power house. Conditions inside as well as outside the boiler must be controlled. In short, the boiler water must be made fit for boiler use, so that it will not damage the boiler, feed and steam lines, economizers or any of the other boiler accessories and so that it will not cause endless expense in steam generation.

The Chemical Balance and Its Control

This can only be done by maintaining the boiler in proper chemical balance, for regardless of the variations that may occur in the feed water, the conditions existing in the boiler water influence the solids which come out of solution and the concentration of the salts held in solution. These accumulations and concentrations form continuously while the boiler is active and steam leaves and water enters the boiler, so that the maintenance of chemical balance within the boiler entails, not only the treatment of the water both outside and inside the boiler, but the continuous removal from the boiler water of the end products and control of concentrations.

As the raw water supply, any natural water, will contain sludge producing water, soluble salts, organic matter and dissolved or entrained gases in some proportions, the initial step in the treatment entailed in making such water suitable for boiler use and establishing the correct chemical balance in the boiler should be to provide a positive and controlled means for producing a maximum quantity of sludge creating solids with a minimum quantity of soluble salts. The second step should then be to remove the precipitated solids, as they form, automatically and continuously, with a minimum blow down loss.

The conditioning of the available water supply in a manner conducive to best results is dependent, obviously, upon the nature of the impurities found in the natural water and while the chemistry of the many reactions entailed in conditioning the water need not be gone into, it is well to differentiate between the two classes of chemical impurities commonly present in the boiler water; those that remain in solution and contribute to soluble concentration and those that become insoluble at boiler temperature and contribute to the formation of scale or sludge. Furthermore, the proper conditioning of boiler water not only precludes the formation of scale, but minimizes the concentration of soluble salts. It also provides



Courtesy: Elgin Softener Corp.

FIG. 1
Sludge deconcentrator applied to a standard bent-tube boiler.

* For previous discussions dealing with boiler water treatment see Paper Trade Journal, April 5, 1928, Feb. 14, 1929, April 11, 1929, and May 15, 1930.

for the removal of the insoluble impurities in the form of concentrated sludge and the control of the soluble concentration in the boiler.

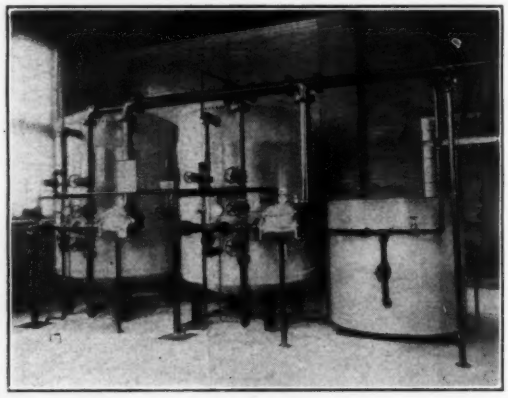
This latter point is of especial importance where high steam pressures and temperatures are entailed, for it is the presence of an excess of alkalinity in the boiler water, introduced by water softening processes or characteristic of the water supply, that exposes the boiler to the dangers of caustic embrittlement.

The necessary protection against this danger entails the introduction, in proper proportions, of some suitable inhibitive agent, customarily some sulphate or phosphate. The recommendations of the A. S. M. E. Boiler Code is that for boilers operating at pressures up to 150 pounds per square inch, the ratio of the sulphate to the total alkalinity of the boiler water (sulphate-carbonate ratio) should be at least 1 to 1; for boiler pressures up to 250 pounds, at least 2 to 1; and for above 250 pounds, 3 to 1. Other authorities, basing their recommendations upon very intensive investigations, go even further and specify ratios as high as 6 to 1 for boiler pressures of 400 pounds, although a sulphate-carbonate ratio of 3.5 to 1 is customarily held to be sufficient to prevent embrittlement at pressures as high as 300 or 400 pounds. These established balances, or ratios, are highly important, not only from the point of view of securing safety in boiler operation, but in the selection of a safe and effective method of water softening.

Water Softening

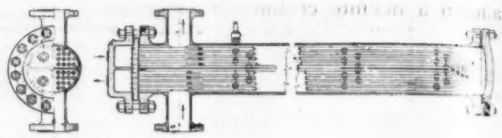
The hardness in the water, to counteract which water softening is employed, is of two kinds; temporary hardness, or the hardness removed from the water by boiling, and permanent hardness, or the hardness which remains in the water after boiling. The former is due chiefly to the presence of the bicarbonates of calcium and magnesium, while the latter is caused by the presence of such salts as the sulphates, chlorides and nitrates of calcium and magnesium as well as iron and silica.

Where large quantities of water are necessarily required for feeding the boilers, as is general in the steam plants serving pulp and paper mills, the removal of temporary hardness by boiling, by the use of evaporators, is not feasible, so some chemical method of securing similar results is resorted to. The use of zeolite water softeners or of lime-soda systems, hot or cold, has been and is still a standard method of softening the water. The zeolite method is an exchange process by which all the salts of



Courtesy: Elgin Softener Corp.

FIG. 3
Arrangement of modern 2-unit zeolite softener plant.



Courtesy: Elgin Softener Corp.

FIG. 2
Sectional view of heat exchanger, showing counter-flow passage of hot blow-down and boiler-feed waters.

calcium and magnesium are changed to soluble salts of sodium, while in lime-soda systems a portion of the carbonates of calcium and magnesium are removed, with the conversion of the permanent hardness of the water to soluble concentration.

In the zeolite process, the bicarbonates of calcium and magnesium are converted into sodium bicarbonate and this latter salt, under the influence of the heat and pressure breaks down, first to sodium carbonate and then to sodium hydroxide, liberating carbon dioxide gas. In the lime-soda process, the absorption of the carbon dioxide that holds the calcium and magnesium salts in solution is effected, thereby precipitating the temporary hardness from the water.

Such precipitation is a time consuming process, however, so that the reduction in hardness is customarily accelerated by employing an excess of the softening chemicals. Heat also stimulating the chemical reactions, the hardness is not apt to be as completely removed by the cold as by the hot lime-soda process. A coagulent can be added to hasten the precipitation, but even so the water fed to the boiler is liable to retain some calcium and magnesium bicarbonates in solution as well as excess chemical reagent, with the result that objectionable "after-reaction" occurs, causing deposits of mono-carbonates in feed lines, heaters and boilers, with high residual alkalinity and apparent permanent water hardness.

The Sodium Salts

With the zeolite process of water softening, while the water fed to the boiler may still contain a little hardness, it will be somewhat softer, but its caustic alkalinity, unless controlled, may expose the boiler to grave danger of embrittlement. The sodium bicarbonate always present in normal waters softened by the zeolite process breaks down, under the influence of pressure and heat, first to the alkaline salt, soda ash, releasing water and carbon dioxide, and subsequently to sodium hydroxide, caustic soda, releasing further carbon dioxide. If the raw water was very hard and has been well softened, the proportion of caustic formed in the boiler will be high and in any event it will soon assume such proportions through the concentration effected by boiler operation. As previously stated, the addition of some suitable inhibitive agent is necessary to guard against any such excessive caustic alkalinity.

The agent most frequently employed for such purpose is another sodium salt, sodium sulphate, and if an adequate proportion of such salt is present in the boiler water, the quantity depending upon the operating pressure of the boiler, prevention of embrittlement of boiler metal is effected. This peculiarity of the salt is, obviously, highly important in the proper conditioning of the boiler water and will be referred to again subsequently.

Sodium nitrate is another of this family of salts frequently contained in boiler feed water and the salt when subjected to heat and pressure in the boiler liberates nitric oxide which hydrolizes to nitric acid, making the water highly corrosive and causing severe pitting of the boiler metal. Here again, it is essential to establish and

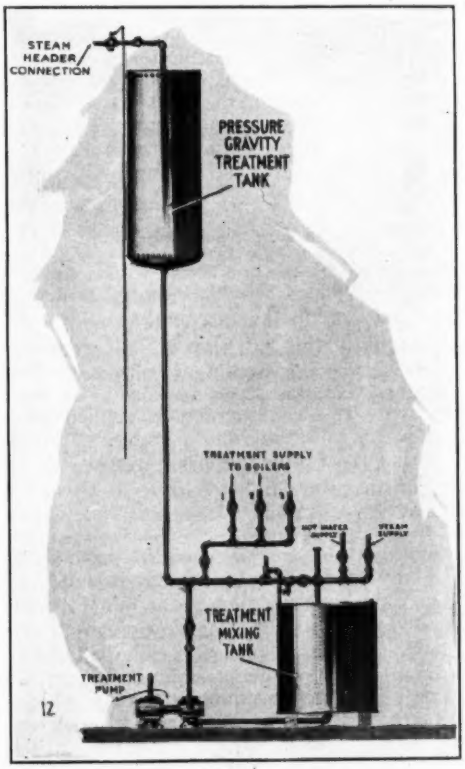
maintain a definite chemical balance in the boiler, with proper alkalinity to counteract the corrosive activity of the salt.

Sodium chloride is still another of this group of salts often present in softened boiler water and one which influences the proper conditioning processes. Though a neutral salt, it has the property when in water to increase the solubility of other salts which alone are quite insoluble. It increases the total solid content of the boiler water and in the presence of oxygen or acid gases is corrosive. The salt itself also increases in solubility with an increase in temperature, stimulating its effect upon other salts.

Chemical Reactions

All these sodium salts present individual problems in the proper control in suitable boiler water conditioning, as do the salts responsible for permanent water hardness, salts held in solution, not by a gas, but by their insolubility in water under created or normal conditions. Calcium sulphate, gypsum, for example, is comparatively insoluble by itself, but with sodium chloride present in the water large quantities of it can be carried in solution. The salt, however, decreases in solubility with increase in temperature and this may influence its deposition as scale by other sulphates or by sodium chloride. Silica, likewise, is ordinarily quite insoluble, but it is soluble in strong alkalies and where a powerful alkaline salt is present, such as sodium carbonate, an appreciable amount of silica may be held in solution.

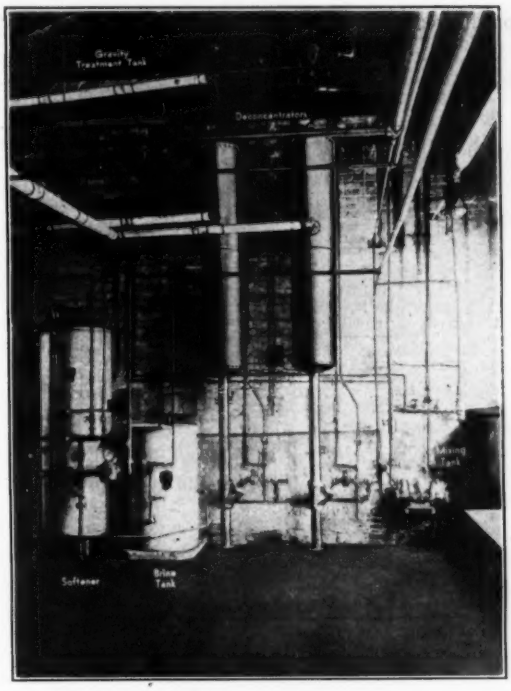
Magnesium sulphate is soluble, as are also the chlorides of calcium and magnesium, all of which may contribute to a considerable extent to the permanent hardness of the boiler water. Iron may exist in water in two forms, iron carbonate and iron sulphate. In normal waters, the iron is found in the form of a bicarbonate and this when allowed to stand in sunlight or exposed to the air oxidizes to form iron hydroxide. On the other hand, sunlight and air do not affect the iron sulphate, a salt which is a sulphuric acid contamination found in the waste from coal mines, the pickling vats at steel mills, etc. The usual treatment for iron sulphate is the addition of an alkaline salt or lime to remove the iron.



Courtesy: Elgin Softener Corp.

FIG. 4

Arrangement of pressure-gravity system of chemical treatment equipment and controls for individual boiler services.



Courtesy: Elgin Softener Corp.

FIG. 5

Installation of sludge deconcentrator and zeolite softener assemblage for conditioning boiler water.

The proper conditioning of boiler water entails the exercise of control over these and many other chemical reactions, which is not only different and more or less individual for each water supply, but may be different for each boiler in a battery. How this may be accomplished in each case is, naturally, beyond the scope of this discussion, but the methods practiced in the essential control of the sulphate-carbonate ratio can be outlined briefly, particularly as the part which may be played by the sodium salts has led to important developments.

Control of Caustic Alkalinity

The potential danger of embrittlement from uncontrolled alkalinity in the boiler water is chiefly that of uncontrolled caustic in the water, a derivative of the soda ash which is the base of the majority, at least, of boiler compounds and also the salt introduced by the zeolite process of water treatment. The addition of a suitable amount of sodium sulphate is the customary method of circumventing this danger, though not the only one.

The high caustic alkalinity is due to the break down of the softening chemical, soda ash, employed to prevent the formation of the costly and objectionable calcium sulphate scale, and for this reason some leading authorities advocate the use of sodium phosphates as the softening chemical, particularly for conditioning water for use in high pressure boilers. The chief advantage claimed for

the use of phosphate as the softening chemical is that under the influence of heat and pressure, the phosphate radical does not disintegrate and almost all the phosphate introduced into a softened water is available for the prevention of calcium sulphate scale. The phosphate radical in the boiler water is also held to be much more effective than the sulphate in inhibiting embrittlement. Still another advantage of the phosphates is that they may be used in several different forms: tri-sodium phosphate, di-sodium phosphate and mono-sodium phosphate or phosphoric acid.

The use of tri-sodium phosphate results in somewhat higher boiler alkalinity than does the use of di-sodium phosphate and the use of the latter compound results in a somewhat higher boiler water alkalinity than does the use of phosphoric acid. With any of these phosphates, moreover, an adequate phosphate radical can be maintained in the boiler water without necessarily maintaining a high degree of alkalinity.

As the phosphates react with calcium and magnesium carbonates to form the corresponding phosphates with soda ash as a by-product, the phosphate radical, which it is desired to have present in the boiler water, will precipitate out in the softener if the softening chemical is added to the raw water. To avoid this reaction, which would necessitate excessive alkalinity in the softener in order that a sufficient amount of the phosphate radical might be carried over in solution to the boiler, to prevent the formation of scale, it is necessary to feed the phosphate in to the water after it has been softened by zeolite, lime-soda or other treatment.

The phosphate treatment, consequently, supplements an initial softening of the water and serves to limit the alkalinity of the boiler water, by so doing minimizing the concentration of soluble salts. On the other hand, where soda ash alone is employed as the softening chemical, as in the case of the ordinary zeolite treatment or when boiler compounds are depended upon for softening the water, the caustic alkalinity created in the boiler is of necessity much more marked and high boiler alkalinity (total) concentration rapidly develops. Introduction of increasingly large proportions of sodium sulphate is then necessary, to provide the required sulphate for effecting and maintaining a proper sulphate-carbonate ratio, or else the destruction of excess alkalinity by means of an acid. Unless this is done, protection against embrittlement is not provided. If it is, an objectionable high concentration of soluble salts results.

Limiting Caustic Concentration by Self Treatment

This decided disadvantage of the high alkalinity resulting from the customary use of soda ash alone as the softening chemical has now been circumvented in an exceedingly ingenious and effective manner, by sharply limiting the amount of caustic allowed to accumulate in the boiler water. This is accomplished by causing a relatively small proportion of soda ash treated water to soften the balance of relatively hard, raw water fed to the boiler, limiting by so doing the concentration of alkalinity.

The soda ash and caustic produced by the zeolite process of water softening are exactly the same materials as are extensively used in the softening of boiler feed water. The lime-soda method uses soda ash for precipitating the permanent hardness and most effective boiler compounds contain soda ash or caustic, frequently both substances. Obviously then, the products of the zeolite process have the same softening effect upon the temporary hardness of raw, untreated, water, upon the calcium and magnesium bicarbonates, as do the most effective boiler compounds. The mixture of a definite quantity of zeolite softened water with the proper quantity of raw water will, in fact, produce a satisfactorily conditioned water supply under the influence of the boiler heat and pressure. The reaction is the same as would result from injecting the proper amount of some effective boiler compound into a boiler supplied with untreated water. The zeolite softened water furnishes its by-products, soda ash and caustic, as the softening chemicals for the precipitation of the hardness in the raw water supply and the treatment takes place in the boiler under the same conditions of pressure, temperature and evaporation responsible for the alkalinity concentration when the entire boiler water supply is zeolite softened.

The excess alkalinity present in the limited supply of zeolite softened water feed is simply utilized to condition the balance of the water supply by precipitation of the raw water hardness, so avoiding the concentration of boiler water alkalinity which of necessity takes place when a conditioned water supply somewhat alkaline and containing free caustic, also the product of the zeolite process, is fed to an active boiler. At the same time, the quantity of sodium sulphate required for effecting the sulphate-carbonate ratio needed for protection against embrittlement is reduced. By properly proportioning the amounts of treated and untreated waters fed to the boiler, all the boiler water can be thoroughly softened and maintained in a condition of zero hardness with strictly limited total and caustic alkalinities, with just sufficient alkalinity for insurance against pitting and the corrosive activity of acid liberating salts.

In this distinctive method of limiting the caustic concentration in the boiler, and the total alkalinity as well, by what may well be termed "self treatment," the reaction between the zeolite, or soda ash, softened water and the raw hard water produces insoluble concentration with a minimum quantity of salts in solution, a concentrated accumulation within the boiler of sludge creating solids. The sludge has to be removed, of course, a process that entails the use of so-called deconcentrator equipment, and it is in the practical consummation of this essential operation that the success of the self-treatment system of boiler water conditioning depends.

Methods of Deconcentration

There are really two methods which under suitable conditions may be used for this essential control over the insoluble concentration that accumulate within the boiler and their removal, that utilizing a sludge deconcentrator and the other a system entailing a continuous blow down with a heat exchanger. Each method, as in the case of the system of water conditioning, is applied to the individual boiler, the boiler and not a battery of boilers being the unit in all cases. Furthermore, the success with which each method may be employed depends upon a definite control over the reactions within the boiler required to produce a maximum quantity of suspended solids, or sludge, and that the correct chemical balance be maintained. As to which of the two methods should advisably be employed, the concentration of the mineral constituents of the raw water is the dominant consideration.

The sludge concentrator consists essentially of a settling tank through which a predetermined proportion of the boiler water circulates continually and in which the insoluble concentration separates from the water and is deposited in the form of sludge, while the clarified water is returned to the boiler. The process is one of separation, whereby the sludge and suspended solids are removed from the boiler water without the waste of blow down. Ordinarily, the quantity of water circulated from the

boiler drum through the concentrator and back to the boiler is about 25 or 50 per cent. of the amount of water evaporated in the boiler per hour, but in extreme cases and where a greater circulation is required for water producing a heavy concentration of sludge as much as 150 per cent. or more of the hourly evaporation may be circulated through the deconcentrator. The circulation of the water is established and maintained by means of the thermo-syphon principle, no pumps, ejectors or other mechanical devices being required.

The deconcentrator is usually located outside the boiler in a vertical position, with a settling space for light flocculent solids in the upper portion and a settling chamber for the heavy scale-forming solids in the lower and relatively cool portion, though where conditions demand the arrangement the deconcentrator can be located within the boiler in a horizontal position above the normal water level. The accumulation of sludge can readily be removed from the concentrator periodically by simply opening the drain line, without appreciable heat or water loss. These details, as well as the various essential connections to the boiler, are plainly shown in the view of one of these sludge deconcentrators connected to a standard variety o fbent tube boiler.

These sludge deconcentrators are the type of equipment for use when conditioning boiler waters of the sludge producing, or suspended matter, variety. Such waters, incidentally, constitute about two-thirds of all the available natural waters in this country. From a few of these supplies, the waters are such that the employment of sludge deconcentrators combined with heat exchangers may be more advisable, in order to conserve all possible heat when blowing the deconcentrator. The need for this more complicated arrangement arises from the fact that the particular waters introduce a problem of soluble concentration as well as of insoluble concentration and it is necessary, consequently, to control the chemical balance of the boiler by the dilution of the concentrated boiler water as well as by the removal of the precipitated insoluble concentration.

In the case of the balance of the available natural waters, the other third, the problem is one of controlling soluble concentration primarily and where these waters are employed in steam generation the required deconcentration and its control are best effected by means of a continuous blow down system combined with a heat exchanger, a dilution process. A predetermined and definite proportion of the water. just enough to maintain the boiler in proper chemical balance, is withdrawn from the boiler by the continuous blowdown and is replaced by fresh feed. In effecting this exchange, all possible heat in the hot blow down is salvaged by the heat exchanger and returned to the boiler.

This heat exchanger consists of a bundle of "U" tubes, through which the blow down water passes and about which feed make-up water circulates, an effective transfer of heat from the hot blow down to the cooler make-up feed taking place in the exchanger. Sensitive control of the blow down is exercised to avoid so far as possible the usual shortcomings of ordinary blow down practice and a considerable proportion of the heat in the blow down water as it escapes from the deconcentrator is returned to the boiler.

The use of the now generally familiar zeolite softener or one of the lime-soda systems for the external (outside the boiler) softening of boiler water may, with many water supplies, afford all the chemical treatment needed and softening equipment of these varieties can readily be utilized, in such circumstances, for supplying the relatively small quantity of softened water needed for the "self treatment" method of limiting the caustic concentration in the boiler. A suitable assemblage of water softening apparatus with a sludge deconcentrator will then constitute a complete, highly economical and effective system for the proper conditioning of the boiler water supply. With many other natural waters however, some further chemical treatment is necessary and, while no attempt will be made to disclose the chemistry of these many treatments, it will be of interest to describe briefly certain equipment and methods evolved to consummate such chemical treatments under positive and sensitive control.

In view of the fact that each boiler should be looked upon, when it comes to a question of maintaining it in proper chemical balance, as an individual unit requiring some special treatment, equipment intended for the application of chemical treatment to boilers should be designed to apply treatment direct to the unit. An assemblage planned with this in view consists of a mixing tank on the boiler room floor level and one or more pressure tanks placed at an elevation somewhat above the water level in the boiler. The necessary chemicals are placed in the mixing tank with the proper amount of water, using either return condensate or raw water, and the mixture pumped to the overhead tank, or tanks, where it is placed under boiler pressure.

The balancing of the pressures in the overhead pressure tank and the boiler unit makes it possible to feed, through suitable needle control valves, the exact predetermined mixture of chemicals needed for the treatment of the boiler water in just the right proportions and quantity direct to the boiler by gravity. A sensitive chemical balance in the boiler is readily established and maintained by this system of chemical treatment and control and the method is especially well suited for applications where the boiler water conditions are such as to require simply a special chemical treatment.

For plants where water softening by sulphate or phosphate treatment is also required for the prevention of embrittlement or treatments for coagulating oil and colloidal matter, a system of chemical treatment and control that is somewhat preferable feeds the required chemicals into the feed line to the boiler. A pressure tank is located on the boiler room floor level and a mixing tank at a slightly higher elevation. The exact chemical mixture for the required specific boiler treatment is prepared in the mixing tank and allowed to flow by gravity to the pressure tank below, which is then cut off from the mixing tank. A supply line, connected to the feed line to the boiler, is then opened and supplies the needed boiler feed pump pressure for forcing th chemical preparation to the individual boiler of sludge deconcentrator, means of sensitive regulation being provided by needle control valves through which the dose of chemicals pass to the boiler or sludge concentrator unit.

(To be continued)

J. E. Mulchaey Passes On

J. E. Mulchaey, superintendent of the Grandfather Falls Company, paper manufacturers, Merrill, Wis., died very suddenly last week at his home from a heart attack. He was 78-years old and had been at work at the mill on the day of his death. Mr. Mulchaey entered the paper industry when he was eleven years old, accepting a job at the Smith Paper Company, Lee, Mass. He came further west when a young man and previous to his connection at Merrill was superintendent of the Flambeau Paper Company, Park Falls, Wis. He came to the Grandfather Falls company eighteen years ago as superintendent. Burial took place at Kaukauna, Wis.

New Press Roll Doctor

A new type of doctor especially suitable for use on press rolls has just been announced by the Bird Machine Company, South Walpole, Mass. A number of installations are already operating in the United States where the new doctor has now completed its trial period. It is understood, however, that the doctor has been in continuous use for a year or more in Great Britain where it has proved extremely successful on a large number of installations and where its performance is creating a considerable sensation.

Developed by Vickery

According to the Bird Machine Company, the new doctor is a further development made by Fred Vickery, British paper machinery designer, of the principle which has made the standard Vickery doctor so successful on paper machine rolls and dryers. The new development is to be called the Vickery hi-angle doctor.

As the illustration shows, the new doctor consists of three simple elements: the holder which is bolted to the doctor support, the spring element and the doctor blade. It will be noted that the blade is supported along its inner edge in the lower slot of the holder. The spring element is supported between the two bearing surfaces in the upper slot of the holder. Neither the blade nor the spring element is clamped. Each is free to compensate for variations in the roll surface. The result is a uniform distribution of pressure to every inch of the roll under all conditions, without the buckling and loss of contact with the roll which is sure to occur, under certain circumstances, with a doctor made up of one or more elements held rigidly.

Steep Angle

From the papermaker's standpoint, the outstanding quality of the new doctor is its freedom from any practical limitation on the operating angle. The steep angle permits the device to operate with lighter pressures, increases the cleaning efficiency of the blade, prolongs its life, and eliminates all chance of the blade's heeling up and permitting fibre and clay to get under it.

All three parts of the Vickery hi-angle doctor have smooth, unbroken surfaces. There is a perfect seal between the blade and the spring element; between the spring and the holder, and between the holder and the doctor support. Under the most difficult operating conditions, the Vickery hi-angle doctor has proved perfectly water-tight.

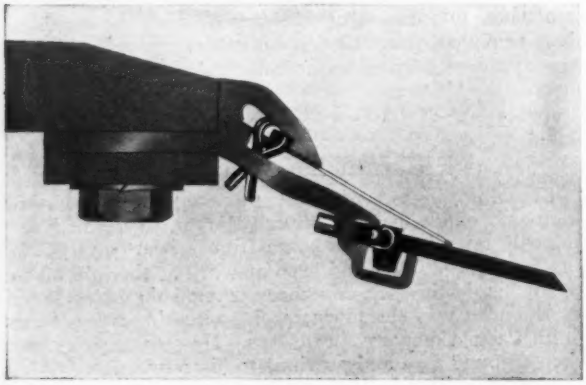


Fig. 1

Diagram of the Vickery Hi-Angle Doctor showing free supports of blade and spring element.

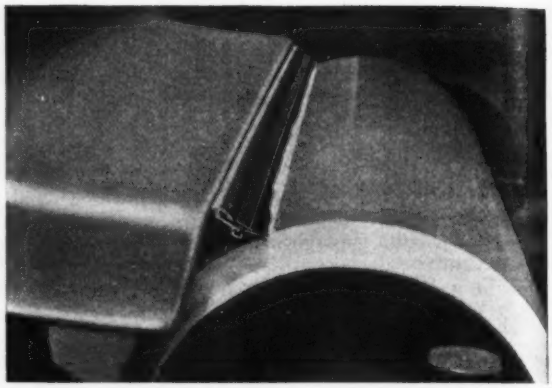


Fig. 2

Vickery Hi-Angle Doctor fitted with composition blade, in operation in a Massachusetts book mill.

Easy Blade Replacement

Another feature of the Vickery hi-angle doctor which has contributed to its popularity is its provision for blade replacement. When the blade finally wears out, it may be replaced quickly and easily, the operation often requiring less than a minute's time. On rolls which can operate momentarily without doctoring, the change can be made while the machine is running.

Because of the simplicity of the blades, their cost is extremely low. This fact, coupled with the prolonged blade life, has resulted in strikingly low maintenance costs. A typical report from an American mill, accustomed to replacing press roll doctor blades every three weeks, states that the original Vickery hi-angle doctor blade shows no appreciable signs of wear after a full month's operation.

Provision is made in the new doctor for the use of blade materials carefully selected for each application.

Illustrations in this article are from a bulletin prepared by the Bird Machine Company and offered by them to all interested paper makers.

To Make Wood Plugs for Paper

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., August 8, 1931.—J. E. Curtis, owner-manager of the Pacific Wood Working plant at Vancouver, Wash., has begun production of wood plugs for roll paper. The Curtis machine will utilize small diameter timber from surrounding territory. Distribution of the new plugs has already begun in northwest markets. The new machine cuts, bores and planes the wood plugs in two operations and is operated by one man.

Pulp Prices Decline in Sweden

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., Aug. 12, 1931—Bleached and easy bleaching sulphite wood pulp prices continued to decline during the first half of July, and a new decline was also noted for wet ground wood according to a report to the Department of Commerce from Consul General, John B. Osborne, at Stockholm. Quotations on strong sulphite, strong sulphate and dry ground wood, on the other hand, continued firm.

100 Tons Kraft Per Day — 58% A. D.
With the Famous Kamyr Wet Machine

Production . . . .

Kraft	up to 100 Tons
Sulphite	up to 80 Tons
Soda	up to 60 Tons
Groundwood	up to 50 Tons

Results . . . . . .

With 1 Press	42% A.D.
With 2 Presses	55% A.D.
With 2 Presses & Predryer	58% A.D.

Saves . . . . . .

Felt, Wires, Labor, Upkeep, Power, Fibre, Floor Space

G. D. JENSSEN CO.

Chrysler Bldg., N. Y. C. *Sole Agents in U. S. A. for* 1017 White Bldg., SEATTLE

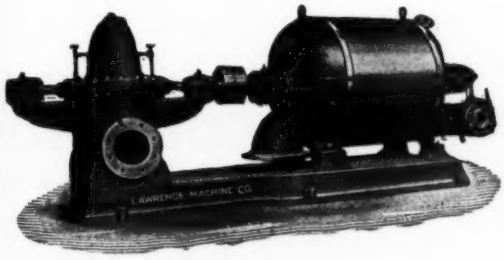
PAPER MACHINERY Ltd.
MONTREAL

Horizontally Split Casing Double Suction Pumps

LAWRENCE PUMPS

The name protects and guarantees you satisfaction.

We are the original designers and builders of the LAWRENCE PUMP.



Lawrence pumps for all conditions and services. Forty-four years of practical experience with centrifugal pump development places us among the leaders. Our efforts have been rewarded by the acceptance of our product in general.

Thousands of installations and the successful performance of our pumps should be sufficient proof of our ability to handle your pumping problems. Our engineering force is at your command.

Have only Lawrence Pumps, manufactured by the

Lawrence Machine & Pump Company
361 Market St. Lawrence, Mass.

FARREL-BIRMINGHAM
COMPANY INC.

50 STATE ST., ANSONIA, CONN.

CALENDERS: Board
CALENDERS: Paper
CALIPERS: Roll
GRINDING MACHINES: Roll
PRESSES: Hydraulic
Calender Roll Recovering
Pulp Dehydrating
ROLLS: Chilled Iron, Dry Sand, Gray Iron, Alloy Iron, Steel
For: Calender Stacks
Board Calenders
Super-Calenders
Glassine Calenders
Friction Rolls
Breaker Rolls
Smoothing Rolls
Creping Rolls
Plater Rolls
Cutting Machines
Paraffining and Waxing Machines
Saturating Machines
Silicating Machines
Miscellaneous Special Purposes

TRANSMISSION MACHINERY:
Gears, Cut: Spur, Single and Double Helical (Farrel-Sykes Continuous Tooth Type)
Speed Reduction Units (Farrel-Sykes)

See PAPER AND PULP MILL CATALOG
LOCKWOOD'S DIRECTORY—1931

Farrel Indicating Calipers show slightest variation in diameter of roll at any point in its length and measure exact amount of crown. Saves many times its cost in preventing lost production time, improving accuracy and reducing time required for checking and measuring rolls.

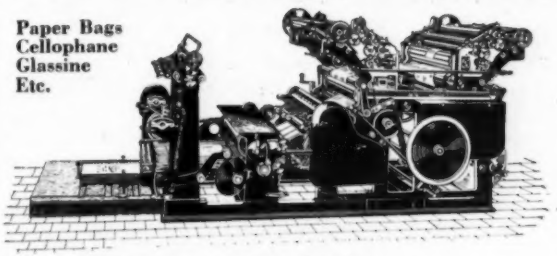
NEW RECORDS FOR PRODUCTION AND PRECISION ARE MADE ON FARREL-BIRMINGHAM MACHINES

For Making and Printing BAGS

MATADOR Bag Machines, manufactured by Windmoller & Holscher, are too well known in this country to need any detailed description. As made today they are better and more profitable to users than ever before.

The same manufacturers also furnish the two-color rotary printing press shown herewith, as well as aniline and other presses for printing up to four colors at high speeds. Complete information about this line of presses, which can be furnished with sheeting, re-reeling, and other auxiliary equipment as required, will be forwarded on request. For the latest and most profitable methods of making and printing paper bags, as well as CELLOPHANE, GLASSINE, and KRAFT PAPER printing, consult—

Paper Bags
Cellophane
Glassine
Etc.



H. H. HEINRICH, INC., 200 VARICK ST., NEW YORK

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING AUGUST 15, 1931

SUMMARY

Cigarette paper	23 cs.
Wall paper	10 bls., 21 cs.
News print	1291 rolls
Printing paper	98 cs.
Wrapping paper	73 bls., 5 cs.
Filter paper	105 bls., 96 cs.
Drawing paper	5 cs.
Cover paper	2 cs.
Writing paper	3 cs.
Surface coated paper	15 cs.
Baryta coated paper	233 cs.
Metal coated paper	49 cs.
Gold coated paper	7 cs.
Photo paper	2 cs.
Marble paper	7 cs.
Tissue paper	8 cs.
Decalcomania paper	33 cs.
Colored paper	84 cs.
Wafer paper	9 cs.
Pith paper	1 cs.
Transparent paper	3 cs.
Copy paper	5 cs.
Basic paper	94 rolls, 1 cs.
Wood pulp paper	2 cs.
Cable paper	1 roll
Stencil paper	19 cs.
Card boards	33 cs.
Miscellaneous paper	50 bdls., 19 bls., 261 cs.

CIGARETTE PAPER

Brown & Williamson Tobacco Co., France, Havre, 8 cs.

Brown & Williamson Tobacco Co., Homeric, Southampton, 10 cs.

Brown & Williamson Tobacco Co., Aquitania, Southampton, 3 cs.

P. J. Schweitzer, Aquitania, Southampton, 2 cs.

WALL PAPER

F. J. Emmerich, Baltic, Liverpool, 2 bls.

Bush Service Corp., American Banker, London, 4 bls.

J. E. Bernard & Co., Columbus, Bremen, 2 bls.

Kensington Wallpaper Co., Homeric, Southampton, 2 cs.

A. L. Diament & Co., Homeric, Southampton, 2 cs.

Guaranty Trust Co., Deutschland, Hamburg, 11 cs.

Globe Shipping Co., Deutschland, Hamburg, 2 cs.

F. J. Emmerich, Deutschland, Hamburg, 4 cs., 1 bl.

F. A. Binder, Deutschland, Hamburg, 1 bl.

NEWS PRINT

Jay Madden Corp., Chickasaw, Kotka, 289 rolls.

Jay Madden Corp., Gen. von Steuben, Bremen, 835 rolls.

——, Deutschland, Hamburg, 167 rolls.

PRINTING PAPER

P. Puttman, Pennland, Antwerp, 17 cs.

P. C. Zuhlke, Pennland, Antwerp, 3 cs.

E. Dietzgen & Co., Statendam, Rotterdam, 37 cs.

T. N. Fairbanks, Co., Exochorda, Genoa, 26 cs.

Japan Paper Co., Columbus, Bremen, 15 cs.

WRAPPING PAPER

Woodward & Lothrop, Pennland, Antwerp, 5 cs.

C. Steiner, Statendam, Rotterdam, 73 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., Minnetonka, London, 10 cs.

H. Reeve Angel & Co. Inc., Homeric, Southampton, 105 bls.

E. Fougera & Co., Homeric, Southampton, 69 cs.

C. Schliecher & Schull Co., Deutschland, Hamburg, 17 cs.

DRAWING PAPER

H. Reeve Angel & Co. Inc., Minnetonka, London, 2 cs.

Devoe & Reynolds Co., Minnetonka, London, 3 cs.

COVER PAPER

International Accep. Bank, Deutschland, Hamburg, 2 cs.

WRITING PAPER

Japan Paper Co., Minnetonka, London, 2 cs.

Leonhardt & Brush, France, Havre, 1 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Pennland, Antwerp, 12 cs.

Brown Bros. Harriman Co., Deutschland, Hamburg, 2 cs.

Phoenix Shipping Co., Deutschland, Hamburg, 1 cs.

BARYTA COATED PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 233 cs.

METAL COATED PAPER

K. Pauli Corp., Gen. von Steuben, Bremen, 19 cs.

American Express Co., Columbus, Bremen, 2 cs.

Taub Hummell & Schnall, Deutschland, Hamburg, 5 cs.

J. Uhlfelder & Co., Deutschland, Hamburg, 2 cs.

K. Pauli Corp., Deutschland, Hamburg, 7 cs.

——, Deutschland, Hamburg, 14 cs.

GOLD COATED PAPER

F. Murray Hill, Gen. von Steuben, Bremen, 7 cs.

PHOTO PAPER

J. J. Gavin & Co., Homeric, Southampton, 2 cs.

MARBLE PAPER

American Shipping Co., Pennland, Antwerp, 7 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., Baltic, Liverpool, 4 cs.

W. J. Byrnes Co., Aquitania, Southampton, 4 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Baltic, Liverpool, 20 cs. (duplex)

C. W. Sellers, Columbus, Bremen, 6 cs.

C. W. Sellers, Deutschland, Hamburg, 7 cs.

COLORED PAPER

E. Dietzgen & Co., Deutschland, Hamburg, 82 cs.

——, Gen. von Steuben, Bremen, 2 cs.

WAFER PAPER

Ipex, Statendam, Rotterdam, 9 cs.

PITH PAPER

Nosawa & Co., Taketoyo Maru, Keelung, 1 cs.

TRANSPARENT PAPER

——, Pennland, Antwerp, 3 cs.

COPY PAPER

Iwai & Co., Hokoruku Maru, Kobe, 1cs.

Iwai & Co., Taketoyo Maru, Kobe, 4 cs.

BASIC PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 1 cs.

C. Bruning Co., Statendam, Rotterdam, 94 rolls.

WOOD PULP PAPER

J. Beckhard Co., Statendam, Rotterdam, 2 cs.

CABLE PAPER

Expansion Associates, Columbus, Bremen, 1 roll.

STENCIL PAPER

J. M. Rush Co., Columbus, Bremen, 1 cs.

Bush Service Corp., Deutschland, Hamburg, 7 cs.

Arlac Dry Stencil Co., Deutschland, Hamburg, 11 cs.

CARD BOARDS

Coty, Inc., France, Havre, 29 cs.

Atlantic F'd'g Co., Deutschland, Hamburg, 4 cs.

MISCELLANEOUS PAPER

J. Romer, Hokuroku Maru, Osaka, 8 cs.

T. N. Fairbanks Co., Hokuroku Maru, Yokohama, 6 cs.

——, Gen. von Steuben, Bremen, 11 bls.

Keuffel & Esser Co., Statendam, Rotterdam, 5 cs.

A. C. Rempert, Caledonia, Glasgow, 12 cs., 8 bls.

Vernon Bros. & Co., Caledonia, Glasgow, 70 cs.

Standard Products Corp., France, Havre, 63 cs.

Titan Shipping Co., France, Havre, 11 cs.

American Express Co., France, Havre, 50 cs.

Keller Dorian Paper Co., France, Havre, 6 cs.

H. Reeve Angel & Co. Inc., G. Maersk, Yokohama, 13 cs.

C. L. Voorhees, G. Maersk, Yokohama, 7 cs.

——, Augustus, Genoa, 10 cs.

J. P. Hefernan Paper Co., Habana, Bilbao, 50 bdls.

RAGS, BAGGINGS, ETC.

Bank of N. Y. & Trust Co., Eastern Prince, B. Ayres, 143 bls. bagging.

Banco Com'l Italiana Trust Co., Tergestea, Venice, 324 bls. bagging.

Chemical National Bank, Gen. von Steuben, Bremen, 46 bls. rags.

Brown Bros. Harriman & Co., Cold Harbor, Dublin, 127 bls. waste paper.

OLD ROPE

International Purchasing Co., Exochorda, Genoa, 163 coils.

Brown Bros. Harriman & Co., Habana, Coruna, 32 coils.

WOOD PULP

Lagerloef Trading Co., Chickasaw, Wiborg, 260 bls. mechanical pulp, 25 tons; 625 bls. sulphite, 105 tons.

——, Chickasaw, Tolkis, 405 bls. sulphite, 81 tons.

Castle & Overton, Inc., Statendam, Rotterdam, 360 bls. wood pulp.

Castle & Overton, Inc., Deutschland, Hamburg, 2466 bls. wood pulp, 493 tons.

Amtorg Trading Corp., (Albany), Schenectady, Leningrad, 3168 cords pulpwood.

E. J. Keller Co. Inc., Yuri Maru, ——, 340 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Corp., Chickasaw, Kotka, 84 bls.

(Continued on page 58)

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

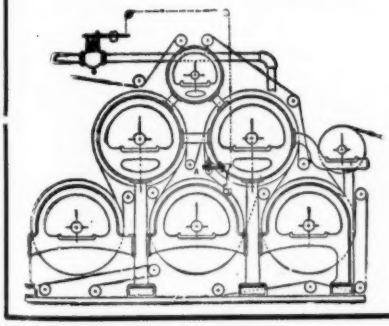
THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

The Pickles Drying Regulator



WE ARE SAFE IN OUR PROPOSITION
YOU'LL MAKE NO MISTAKE IN ACCEPTING IT

Pickles Drying Regulator

will do everything we claim for it and more. The test costs you nothing until you are satisfied. Many mills tried one and now have every machine equipped. Write for list of users and other information.

W. F. PICKLES **Buckland, Conn.**

Imports of Paper and Paper Stock

(*Continued from page 56*)

WOOD FLOUR

State Chemical Co., Tomalva, Rotterdam, 473 bags, 34590 ks.

State Chemical Co., Statendam, Rotterdam, 400 bags.

NORFOLK IMPORTS

WEEK ENDING AUGUST 15, 1931

Lagerloef Trading Co., Chickasaw, Wiborg, 6656 bls. sulphite, 1166 tons; 1789 bls. sulphate, 297 tons.

Lagerloef Trading Co., Chickasaw, Kotka, 138 rolls boards, 53 tons; 3310 bls. wood pulp, 662 tons; 185 bls. sulphite, 31 tons; 3190 bls. sulphate, 570 tons.

——, Chickasaw, Tolkis, 2146 bls. sulphite, 435 tons.

NEW ORLEANS IMPORTS

WEEK ENDING AUGUST 15, 1931

Hibernia Bank & Trust Co., Tergestea, Venice, 20 bls. bagging.

PHILADELPHIA IMPORTS

WEEK ENDING AUGUST 15, 1931

Lagerloef Trading Co., Chickasaw, Wiborg, 6875 bls. sulphite, 1304 tons; 340 bls. sulphate, 56 tons.

Lagerloef Trading Co., Chickasaw, Kotka, 270 bls. wood pulp boards; 698 rolls wood pulp boards.

——, Exochorda, Alexandria, 87 bls. rags.

Hoffman Lion Mills, Takaoka Maru, Osaka, 125 bls. rags.

J. M. Hagy Waste Works, Takaoka Maru, Osaka, 50 bls. rags.

E. J. Keller Co. Inc., West Arrow, ——, 170 bls. rags; 147 bls. bagging.

E. J. Keller Co. Inc., West Harcuvar, ——, 505 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING AUGUST 15, 1931

S. Shapira & Sons, G. Maersk, Yokohama, 329 bls. rags.

BOSTON IMPORTS

WEEK ENDING AUGUST 15, 1931

Oxford University Press, Baltic, Liverpool, 5 cs. printing paper.

1st National Bank of Boston, Takaoka Maru, Kobe, 20 bls. rags.

E. J. Keller Co. Inc., Pipestone County, ——, 60 bls. bagging.

Reduction Does Not Affect All Workers

HUDSON FALLS, N. Y., August 17, 1931.—A statement given out this week by John F. Burke, president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, disclosed that the wage reductions at the mills of the Union Bag and Paper Corporation do not affect all employees. Mr. Burke said that union employees receiving 40 cents an hour will receive no reduction. Those receiving from 40 to 46 cents an hour have received a reduction of one cent and those working for 46 to 52 cents have been decreased two cents an hour. However, the higher paid employees such as paper makers, skilled machinists and other mechanics are affected most by receiving reductions amounting to seven and eight cents an hour. It was also learned that the higher paid workers volunteered to take the greater reductions in order that the others would not be severely affected.

Th task of demolishing the remains of the sulphite tower at the Fenimore mill of the Union Bag and Paper Corporation is nearing completion. Portions of the wall have been torn down by the use of a large tractor while a force of workmen have been kept busy in removing the bricks in other sections. It is expected that it will require several more weeks to complete the job.

H. F. Burkhardt Returns to Holyoke

HOLYOKE, Mass., August 4, 1931.—Harry F. Burkhardt, who has been connected with the Davenport, Ia. branch of the White & Wyckoff Manufacturing Company of this city, has been transferred to the local plant where he will be manager of the tablet department. Mr. Burkhardt left Holyoke nine years ago for Minneapolis where he was representative of the Western Tablet and Stationery Company. When the Davenport branch was opened of the White & Wyckoff Company he became connected with that plant.

Super-Johnson Clutch Catalog

The Carlyle Johnson Machine Company, Manchester, Conn., is now issuing its Super-Johnson catalog, featuring the improvements and advantages of their new Super-Johnson clutch. In this new type of clutch the expanding friction ring is faced on its outside diameter with a special heat resisting material. A copy of this new catalog will be mailed on request.

To Be Sales Manager of Regal Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

PULASKI, N. Y., August 10, 1931.—A reorganization of the executive force of the Regal Paper Co. is to be effected and George D. Hull, of Rochester, has been selected to fill the position as sales manager. He will take over his new duties in a few days. Mr. Hull is a former resident of this place and was graduated from the public school here in 1902. Since finishing a course at the University of Buffalo in 1907 he has been extremely active in business circles.

For the past few years he has been connected with the Rochester branch of Sutro Brothers, a prominent brokerage firm, and from 1919 to 1927 he was district office purchaser for the F. W. Woolworth, being stationed at Wilkes-Barre. His close relationship with chain store buying is expected to prove of valuable aid inasmuch as a large portion of the lines of the Regal concern is sold to various retail establishments throughout the entire United States.

Heads Knowlton Bros.

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., August 17, 1931.—G. Seymour Knowlton was chosen president of Knowlton Brothers, Inc., at a meeting of the board of directors held this week. He has been treasurer for several years and succeeds his father, the late George W. Knowlton, who died recently. Other officers elected at the meeting included Willis H. Howes, vice president, H. E. Harmon, secretary, and J. C. McCormick, treasurer. The board of directors chosen for the year is composed of G. S. Knowlton, W. H. Howes, H. E. Harmon, T. E. Knowlton and J. C. McCormick.

Norwegian Lock Out Continues

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., August 19, 1931.—Every attempt to arrive at a new wage agreement for workers in the Norwegian paper and pulp industry has been unsuccessful according to reports reaching here. In the meantime negotiations are being continued, but inasmuch as neither side seems to be willing to make further compromise it is expected that the lockout may continue for some time. Stocks of Norwegian paper, especially news print, have been used up and Norwegian newspapers are now dependent upon Swedish sources of supply.

The B.C. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

"BAMBLE"
Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

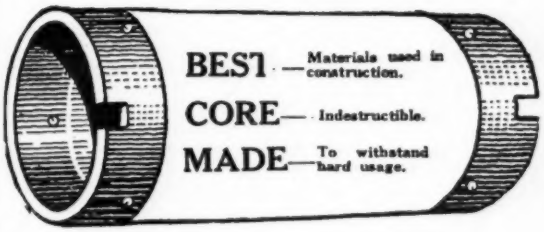
SHIPPING INSURANCE

The Use of

ELIXMAN CORES

protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

SHIPPING INSURANCE

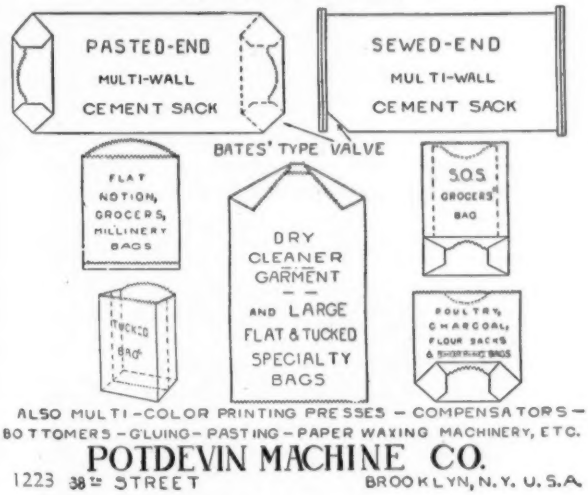


Your two sources of supply are

Canadian Elixman Company
HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

POTDEVIN
OVER 60 MODELS OF PAPER BAG
MACHINERY
FOR PLAIN OR PRINTED



ALSO MULTI-COLOR PRINTING PRESSES — COMPENSATORS — BOTTOMERS — GLUING — PASTING — PAPER WAXING MACHINERY, ETC.

POTDEVIN MACHINE CO.
1223 38TH STREET BROOKLYN, N.Y. U.S.A.

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers

also

Bleached Spruce Sulphite and Soda Kraft Pulp

230 Park Ave. New York
35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts.. Philadelphia, Pa.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, August 19, 1931.

Trading in the local paper market during the past week was light. Inquiries for future needs were fairly numerous, however, and business should become more buoyant after the Labor Day holidays. Sales forces of the leading paper houses are planning a strenuous Autumn campaign. Prices are generally holding to formerly quoted levels.

Conditions in the news print market are practically unchanged. Statistics gathered by the News Print Service Bureau show that the total North American production for July amounted to 309,167 tons, while the total output for the first seven months of the year reached 2,193,194 tons. Stocks at the mills at the end of July totalled 80,904 tons.

Demand for the various grades of paper board was moderately active. Prices continue fairly steady. The fine paper market was rather quiet, although the outlook for the future is promising. Tissues are going forward in seasonal volume. Some improvement was noticed in the coarse paper market. Kraft wrapping paper is moving with regularity.

Mechanical Pulp

Although affected by the prevailing quietness, the ground wood market is considered in a strong statistical position. Production has been somewhat curtailed both in this country and abroad and accumulations are not excessive. There are a moderate number of inquiries around. Prices remain unchanged, in most instances.

Chemical Pulp

No radical changes have been reported in the chemical pulp market for some time past. The feature of the week's trading was the continued firmness of kraft pulp. No. 1 imported kraft pulp is quoted at from $1.50 to $1.70 and No. 2 kraft pulp at from $1.40 to $1.50, on dock, Atlantic ports. Domestic kraft pulp is selling at from $1.60 to $2.75, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market is dull. Demand from the paper mills for both foreign and domestic old manila rope is restricted at present. Small mixed rope is moving in fair volume. The bagging market is irregular. Scrap bagging is steady. Roofing bagging and gunny bagging are slow. Prices are practically unchanged.

Rags

Now that the vacation season and the torrid weather are passing away, a better feeling is developing in the domestic rag market. For the present, however, demand for the various grades is light, but with stocks reported low, it is believed that many paper mills will have to replenish their supplies in the near future. The imported rag market is very quiet.

Waste Paper

The improvement experienced in the paper stock market of late is well maintained. Demand from the paper board mills for the lower grades is persistent and No. 1 mixed paper and strictly folded news are in particularly good request, with offerings decidedly limited. Old kraft machine compressed bales continue to move freely.

Twine

Steadiness prevails in the twine market. Sales of the various grades during the past week were approximately equal to sales in the corresponding period of the preceding year. Supplies are moving into consumption in good volume. Inquiries are fairly numerous and prospects for the closing months of the year are bright.

C. T. Jewell Resigns from St. Regis

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., August 10, 1931.—Announcement is made of the resignation of Corwin T. Jewell as general manager of the group of mills controlled by the St. Regis Paper Company in Northern New York following many years of service. His connection with the paper industry dates from 1904 when he secured the position as fourth hand with the Champion Paper Company at Carthage. After being with that concern for a short time he obtained a better position with the Island Paper Company in the finishing and shipping departments. Later on he was connected with the De Grasse Paper Company at Pyrites and the mill of the St. Regis Paper Company at Deferiet. He also spent a year with the Carthage Sulphite, Pulp and Paper Company where he gained valuable experience.

Upon leaving that concern he returned to the Deferiet mill where he remained for several years before being appointed to a responsible position in the sales department of the St. Regis Paper Company. Early in 1919 he was made superintendent of the Herrings branch and retained that position until 1921 when he was promoted to the post as assistant general manager of the entire group of mills in Northern New York. Upon the death of the late Charles C. Burns he took over the general management and has filled that position successfully for the past eight years.

Two years ago Mr. Jewell suffered from a breakdown in health which forced his confinement to the Clifton Springs sanatorium for some time. During the time he was ill there was a number of changes made in the St. Regis interests which resulted in the kraft division being placed under the management of another man. Some announcement regarding the selection of his successor is expected in a few days.

Organization at Mohawk Mills

COHOES, N. Y., August 17, 1931.—Organization of the new corporation which has purchased and is to operate the Mohawk Paper Mills at Cohoes and Waterford, N. Y., is being completed and it is expected that it will take over the operation of both mills about September 1. The transfer will be made without interruption of the business. Harry I. Prankard and C. T. Wright will continue in charge of the mills.

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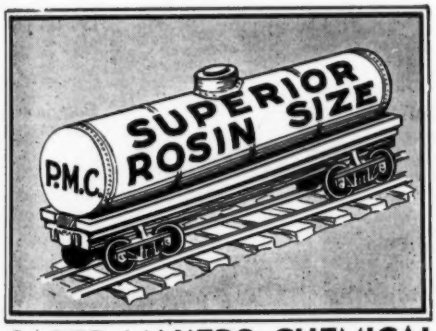

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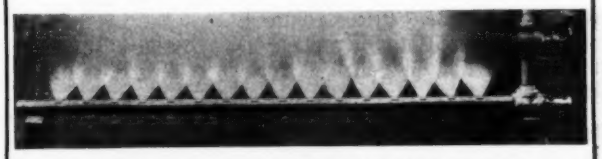

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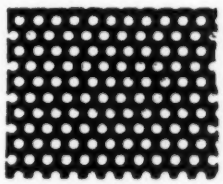

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All Kellogg Welded Products Are Insurable

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, August 19, 1931.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Contract shipments are moving in fair volume. The pulp is quoted at from $42.50 to $45.00 per ton and the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Trading in the bleaching powder market was moderately active during the past week. The contract movement was normal. Prices are generally holding to schedule. Bleaching powder is quoted at from $2 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues quiet. Domestic standard ground is quoted at 6 cents and finely ground at 7½ cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is rather restricted. Prices generally remain unchanged. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly active, considering the business depression. Prices are holding to schedule. Imported china clay is quoted at from $13 to $21 per ton; while domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. Shipments against contract are going forward to the paper mills in seasonal volume. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multo-unit cars, in ton lots, or over, at works.

ROSIN.—No radical changes transpired in the rosin market. The grades of gum rosin used in the paper mills are quoted at from $4.10 to $4.25 per 280 pounds, in barrels, at works. Wood rosin is selling at $3.70 per 280 pounds, in barrels, on dock, car lot quantities.

SALT CAKE.—The salt cake market is exhibiting a strong undertone. Prices continue steady. Salt cake is quoted at from $16 to $17 and chrome salt cake at from $14 to $15 per ton, in bulk, at works. Imported salt cake is selling at from $15 to $15.50 per ton, ship side.

SODA ASH.—Conditions in the soda ash market are fairly satisfactory. The contract movement is seasonal. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.15; and in barrels, $1.38.

STARCH.—Most of the business transacted in the starch market during the past week was along routine lines. Prices are generally holding to formerly quoted levels. Special paper making starch is selling at $2.67, in bags; and at $2.94 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—While demand for sulphate of alumina was light during the week, the position of the market is sound. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is fairly steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Seasonal conditions prevail in the talc market. While demand is light, the contract movement is normal. Prices remain unchanged. Domestic talc is quoted at from $16 to $18 per ton, in bulk; while imported talc is selling at $18 to $22 per ton, ship side.

Market Quotations

Paper

(F. o. b. Mill)	
Ledgers	11.00 @38.00
Bonds	6.75 @53.25
Writings—	
Extra Superfine	14.00 @32.00
Superfine	14.00 @32.00
Tub sized	10.00 @15.00
Engine sized	6.75 @11.00
Book, Cased—	
S. & S. C.	5.25 @ —
M. F.	5.00 @ —
Coated and Enamel	6.75 @10.25
Lithograph	7.25 @11.75
Tissues—Per Ream—	
White No. 1	.65 @ .70
Anti-Tarnish M. G. only	.65 @ .70
Colored	.70 @ .90
White No. 2	.55 @ .60
Kraft	.65 @ .70
Manila	.55 @ .60
Manila—	
No. 1 Jute	9.00 @ 9.25
No. 2 Jute	7.75 @ 8.50
No. 1 Wood	4.00 @ 5.25
No. 2 Wood	3.50 @ 4.00
Butchers	3.37½ @ —
Fibre Papers—	
No. 1 Fibre	4.25 @ 5.50
No. 2 Fibre	4.00 @ 4.75
Common Bogus	1.50 @ 3.00
Screenings	2.00 @ 3.00
Card Middles	4.00 @ 5.00
Glassine—	
Bleached, basis 25 lbs., No. 1	.09¾ @ —
No. 2	.11¼ @ —
Bleached, basis 20 lbs.	.11¼ @ —
(Delivered New York)	
News, per ton—	
Rolls, contract	57.00 @ —
Rolls, spot	57.00 @ —
Sheets	62.00 @ —
Side Runs	42.00 @46.00
Kraft—	
No. 1 Domestic	4.50 @ 5.75
No. 2 Domestic	4.00 @ 4.50
Southern	3.45 @ 4.25
Imported	6.00 @ 7.00
Boards—per ton—	
News	26.00 @27.50
Straw	34.50 @45.00
Chip	26.00 @27.50
Binders' Boards	65.00 @70.00
Standard 85 Test Liner	32.50 @35.00
Sgl. Mla. Lt. Chip	37.50 @42.50
(F. o. b. Mill)	
Wood Pulp Boards	70.00 @80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—	
Moist	24.00 @28.00
Dry	26.00 @28.00
(F. o. b. Mill)	
No. 1 Domestic	25.00 @30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—	
Bleached	2.50 @ 3.50
Easy Bleaching	2.15 @ 2.35
No. 1 strong unbleached	1.90 @ 2.25
Mitscherlich unbleached	2.00 @ 2.25
No. 2 strong unbleached	1.75 @ 1.90
No. 1 Kraft	1.50 @ 1.70
No. 2 Kraft	1.40 @ 1.50
Sulphate—	
Bleached	2.75 @ 3.25
(F. o. b. Pulp Mill)	
Sulphite (Domestic)—	
Bleached	2.25 @ 4.75
Easy Bleaching	2.50 @ 2.75
News	1.80 @ 2.50
Mitscherlich	2.40 @ 3.00
Kraft (Domestic)	1.60 @ 2.75
(Delivered Paper Mills)	
Soda Bleached	3.00 @ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—	
New White, No. 1	6.50 @ 7.00
New White, No. 2	5.50 @ 6.00
Silesias No. 1	5.25 @ 5.50
New Unbleached	7.00 @ 7.50
New Blue Prints	4.00 @ 4.50
New Soft Blacks	3.50 @ 4.00
Blue Overall	5.00 @ 5.25
Fancy	3.00 @ 3.50
Washables	2.75 @ 3.00
Mixed Khaki Cuttings	3.50 @ 4.00
Pink Corset Cuttings	5.00 @ 5.50
O. D. Khaki Cuttings	4.50 @ 4.75
Men's Corduroy	3.00 @ 3.50
New Mixed Blacks	3.00 @ 3.25

Old Rags

White, No. 1—	
Repacked	5.25 @ 5.75
Miscellaneous	4.25 @ 4.75
White, No. 2—	
Repacked	3.00 @ 3.50
Miscellaneous	2.30 @ 2.50
St. Soiled, White	1.50 @ 1.75
Thirds and Blues—	
Repacked	2.25 @ 2.50
Miscellaneous	1.65 @ 1.85
Black Stockings	3.25 @ 3.75
Roofing Rags—	
Cloth Strippings	1.25 @ 1.30
No. 1	1.25 @ 1.30
No. 2	.90 @ 1.00
No. 3	.70 @ .80
No. 4	.65 @ .70
No. 5A	.50 @ .60

Foreign Rags

New Rags

New Dark Cuttings	2.00 @ 2.15
New Mixed Cuttings	2.10 @ 2.40
New Light Silesias	5.00 @ 5.38
Light Flannelettes	5.00 @ 5.25
Unbleached Cuttings	6.50 @ 6.75
New White Cuttings	6.00 @ 6.25
New Light Oxfords	5.00 @ 5.50
New Light Prints	3.10 @ 3.25

Old Rags

No. 1 White Linens	6.25 @ 6.50
No. 2 White Linens	5.25 @ 5.50
No. 3 White Linens	3.75 @ 4.25
No. 4 White Linens	2.25 @ 2.75
No. 1 White Cotton	4.50 @ 5.00
No. 2 White Cotton	3.50 @ 4.25
No. 3 White Cotton	2.50 @ 3.25
No. 4 White Cotton	1.50 @ 1.75
Extra Light Prints	1.90 @ 2.10
Ord. Light Prints	1.75 @ 1.90
Med. Light Prints	1.40 @ 1.55
Dutch Blue Cottons	1.50 @ 1.60
French Blue Linens	2.25 @ 2.40
German Blue Linens	2.00 @ 2.10
German Blue Cottons	1.35 @ 1.40
Checks and Blues	1.40 @ 1.45
Lindsay Garments	.90 @ 1.00
Dark Cottons	.70 @ .75
Old Shopperies	.65 @ .70
New Shopperies	.60 @ .65
French Blues	1.40 @ 1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—	
Foreign	1.55 @ 1.65
Domestic	1.65 @ 1.80
Wool Tares, light	1.15 @ 1.20
Wool Tares, heavy	1.15 @ 1.20
Bright Bagging	1.10 @ 1.15
Small Mixed Rope	.90 @ 1.00
Manila Rope—	
Foreign	1.75 @ 1.85
Domestic	1.90 @ 2.00
New Burlap Cut	1.70 @ 1.80
Hessian Jute Threads—	
Foreign	2.60 @ 2.75
Domestic	2.80 @ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—	
Hard, white, No. 1	2.65 @ 2.85
Hard, white, No. 2	2.10 @ 2.20
Soft, white, No. 1	2.10 @ 2.20
White envelope cuttings	2.35 @ 2.50
Flat Stock—	
Stitchless	.70 @ .80
Overissue Mag	.70 @ .80
Solid Flat Book	.60 @ .70
Crumpled No. 1	.48 @ .53
Solid Book Ledger	1.75 @ 1.85
Ledger Stock	.65 @ .75
New B. B. Chips	.20 @ .30
Manilas—	
New Env. Cut	1.75 @ 1.85
New Cuttings	1.40 @ 1.50
Extra No. 1 old	1.10 @ 1.25
Print	.45 @ .50
Bogus Wrapper	.45 @ .50
Container	.30 @ .35
Old Kraft Machine—	
Compressed bales	1.20 @ 1.30
News—	
No. 1 White News	1.60 @ 1.65
Strictly Overissue	.35 @ .45
Strictly Folded	.25 @ .30
No. 1 Mixed Paper	.25 @ .30
Common Paper	Nominal

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FOR
AMERICAN TRADE

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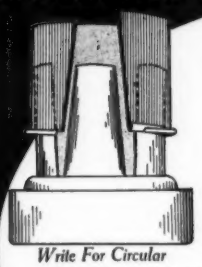
Cut Down The "Core Account"
By Using The
ONEIDA CHUCK
YOU CAN USE INEXPENSIVE PAPER CORES OR ROLLS WITHOUT CORES AND SAVE COST AND LABOR OF RETURNING CORES.



Key enters and expands clip, producing tight grip on inside of core end. Permits running down of paper to last thickness without damage to core. Safer, more efficient and economical than ordinary wedge chucks. Made to fit standard sizes of cores and shafts.
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Chicago New York Portland, Ore.

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	—
No. 2	.11	@	—
Tube Rope—			
4-ply and larger	.09	@	—
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine			
Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.21	@	.22

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No. 2 S.&S.C. Book	.05¼	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.07	@	.07¼
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	—	@	—
No. 1 Soft Shavings	2.10	@	2.15
Ledger & Writings	.70	@	.75
Solid Books	.75	@	.80
Blanks	1.60	@	1.65
Krafts	1.25	@	1.35
New Kraft Cuts	1.35	@	1.45
Manila Env. Cuts	1.50	@	1.55
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.28	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.12	@	.25
Fine, No. 3	.07	@	.20
Book, M. F.	.04¾	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.07	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03¼	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	29.00	@	30.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00	@	—
No. 2, per ton	66.00	@	—
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06½
New White, No. 2	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias soft	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½	@	.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed	.03	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.35
No. 2 Hard White	2.00	@	2.05
No. 1 Soft White	1.75	@	1.85
No. 2 Soft White	1.30	@	1.45
No. 1 Mixed	.75	@	.80
No. 2 Mixed	.50	@	.55
Solid Ledger Stock	1.25	@	1.30
Writing Paper	.70	@	.80
No. 1 Books, heavy	.75	@	.80
No. 2 Books, light	Normal		
No. 1 New Manila	1.60	@	1.75
No. 1 Old Manila	1.25	@	1.30
Print Manila	.40	@	.50
Container Manila	.40	@	.45
Old Kraft	.90	@	1.05
Common Paper	.20	@	.25
No. 1 Mixed Paper	.25	@	.30
Straw Board, Chip	.35	@	.40
Binders Board, Chip	.35	@	.45
Corrugated Board	.40	@	.45
Overissue News	.35	@	.40
Old Newspaper	.25	@	.30

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	.03¾	@	.04½
(F. o. b. Boston)			
Southern Kraft	.03¾	@	.04
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	56.50
Straw Board, rolls.009	—	@	52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	27.50	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	40.00	@	45.00
Single White, Patent Coated News Board—Binder	52.50	@	60.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	2.00	@	2.25
No. 2 Mixed	.60	@	.65
No. 1 Mixed	.90	@	1.00
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.60	@	.65
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	—	@	1.25
Manila	.80	@	.90
No. 1 Mixed Paper	.16	@	.20
Print Manila	.35	@	.40
Overissue News	—	@	.40
Old Newspapers	.25	@	.30
Box Board, Chip	.16	@	.20
Corrugated Boxes	.35	@	.45

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	1.55	@	—
Domestic	1.50	@	—
Manila Rope—			
Foreign	—	@	1.75
Domestic	—	@	2.00
Transmission Rope	1.40	@	1.50
Mixed String	.50	@	.55
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	1.10	@	1.25
Scrap Sisal	1.35	@	1.45
Scrap Sisal for shredding	1.50	@	1.60
Wool Tares, heavy	1.25	@	1.30
New Burlap Cutting	1.50	@	1.25
Australian Pouches	2.00	@	2.25
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.90	@	1.05
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.06½	@	.07
New White No. 2	—	@	.06
Silesias No. 1	.06	@	.06¼
New Black Silesias	.02½	@	.02¾
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.60	@	1.80
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	—	@	.63
No. 2	—	@	.58
No. 3	—	@	.53

Foreign Rags
(F. o. b. Boston)

Dark Cottons	—	@	.70
New No. 1 White Shirt Cuttings	6.50	@	6.75
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.80	@	.90

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	08½	@	—
No. 1 Colored	.11¼	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	6.65	@	—
No. 3 M. F. (carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft No. 2	5.40	@	—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.80	@	—
Soft White	2.60	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.10	@	—
Light and Crumpled Book Stock	1.20	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.80	@	—
Kraft	1.90	@	—
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

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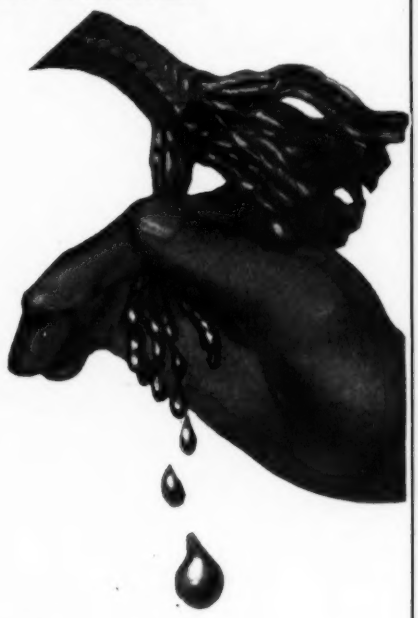

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